TRAINING MODULE
ON
HIV INFECTION & AIDS
FOR
MEDICAL OFFICERS

ANDHRA PRADESH STATE AIDS CONTROL SOCIETY
(APSACS)

सत्यमेव जयते

NATIONAL AIDS CONTROL ORGANISATION

16575
CLIC
SOPHEA
Community Health Library and Information Centre (CHLIC)
CPHE - SOCHARA
Koramangala
Bangalore - 34

Dr. Mani

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Glossary

AIDS	Acquired Immuno Deficiency Syndrome
ARC	AIDS case related complex
ASC	AIDS case surveillance coordinator
CD4	Cluster differentiate 4
CDC	Centre for Disease Control, Atlanta, ISA
CIC	Circulating Immuno Complex
ELISA	Enzyme linked Immuno-Sorbent Assay
FP	Family planning
GPAT	Gelatin particle agglutination test
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
HFWTCs	Health Family Welfare Training Centre
IEC	Information Education & Communication
IFT	Immuno Flourescent Technique
ILO	International Labour Organisation
IVDU	Intravenous drug user
LAT	latex Agglutination
LGV	Lymphogranuloma Venarium
LRM	Learning Resource Material
LTP	Lymphoid Interstitial Pneumonitis
MCH	Maternal and Child Health
NACO	National AIDS Control Organisation
PCP	*Pneumocystis carinii* Pneumonitis
PGL	Persistent Glandular Lymphadenopathy
PHAT	Passive Haemagglutination test
PID	Pelvic Inflamatory disease
PRAM	Physician Responsible for AIDS management
PVO	Private Voluntary Organisation
RIA	Radio Immuno Assey
RNA	Ribonuclecic Acid
RT	Reverse Transcriptase (Enzyme)
STD	Sexually transmitted disease
TB	Tubercle Bacilli/Tuberculosis

Training Module on HIV Infection/AIDS for Medical Officers of Primary Health Centres

INTRODUCTION

The Government of India, Ministry of Health & Family Welfare, has initiated concerted efforts towards prevention of transmission of HIV infection through various strategies which are being coordinated by the National AIDS Control Organisation. There is a need to allay the psychological tension and anxiety among the public due to fear of the disease as well as to dispel various myths regarding the disease among people. Efforts to tackle this problem, through counselling and health education of the community, should form a part of the routine responsibilities of health personnel in all settings and all levels of care. Misconceptions and fear and anxiety regarding infectivity of the patients among health care workers is also not uncommon. Preparing the health care providers to face the situation through appropriate training is one major effort being taken by National AIDS Control Organisation (NACO).

The Medical Officers at the primary care level/setting in the rural as well as urban areas are already involved in various health care activities which have a strong bearing on HIV infection/ AIDS Control namely provision of MCH and F.P. Services including condom distribution, detection & treatment of STD & Tuberculosis, both conditions having direct relation with HIV infection/ AIDS; provision of curative services to various conditions like chronic diarrhoea, which may or may not be clinical presentation of AIDS Cases; provision of IEC (Information Education & Communication) Services to the people on Health and family welfare related subject etc. Since AIDS is a major concern of all involved in health care the Medical officers in Primary Health care settings are expected to play a significant role in its prevention.

The major tasks related to HIV Infection/AIDS Control that could be performed by Medical Officers in the primary health care would include:

1. Identification of individuals with High Risk behaviour and appropriate referral to the concerned specialised institutions for diagnosis, counselling and education.
2. Counselling of HIV infected individuals/AIDS Cases referred back to the primary health care setting from specialised institutions.
3. IEC for the community on HIV infection/AIDS particularly focusing on adolescents and young adults.
4. Diagnosis and treatment of STD.
5. Clinical management of known HIV/AIDS cases in the health care settings as well as in the community in the patients' homes.
6. Training of PHC Team members in relation to National AIDS Control Programme.
7. Integration of HIV Infection/AIDS Control activities in the routine activities like MCH & F.P. R.C.H. Services, Tuberculosis & STD Control activities.

For undertaking these activities, it is imperative that the Medical officers have adequate knowledge about clinical, epidemiological and social features of the HIV Infection/AIDS. They should posses required competence in undertaking appropriate control measures. They should also be aware about the type of activities, programmes and strategies being adopted by the Central and the State Governments in the country towards controlling this major public health scourge.

The module is one such learning Resource Material (LRM), to be used for the training of Medical Officers in primary health care settings, both rural and urban.

AIM

The aim of this module is to train medical officers for upgrading their knowledge and skills in relation to epidemiology, prevention and control of HIV Infection/AIDS, and integrate related activities into on-going health care activities.

INTRODUCTION TO THE MODULE

A module is a self-contained unit of learning which would contain a description of the learning objectives, certain information for reading and understanding, as well as some related activities/ exercises to be performed by the trainee(s) to ascertain the successful learning.

This module on HIV Infection/AIDS has 12 units, each unit dealing with specific aspects related to the problem and its control. Each Unit is planned in a sequential manner so as to maintain a link between various aspects related to HIV Infection/AIDS.

Observations/Suggestions are welcome. They may be addressed to:

Dr. P.L. Joshi
National AIDS Control Organisation (NACO)
Ministry of Health & Family Welfare
Nirman Bhavan
New Delhi-110011

Unit - I

Epidemiology of HIV Infection/AIDS

LEARNING OBJECTIVES

At the end of completing this Unit you should be able

- To understand the distribution of HIV infection/AIDS in terms of time, place and person, nationally and globally.
- To understand modes of transmission of HIV infection.
- To understand the natural history of HIV infection and its progress to AIDS.
- To understand various risk factors related to HIV transmission.

INTRODUCTION

The disease AIDS is 18 year old. Till 1981 nobody knew about this disease which has now become the second most common cause of death amongst young adults in the U.S.A. The disease started firstly among the young homosexual in the West Coast of America. Soon the myth was removed it was detected not only in the homosexuals but also was detected amongst the female commercial sex workers of New York who where taking addictive drugs through unsterilised needles. Soon it was also discovered in the haemophiliacs and thallaesemics children who were taking repeated blood transfusions.

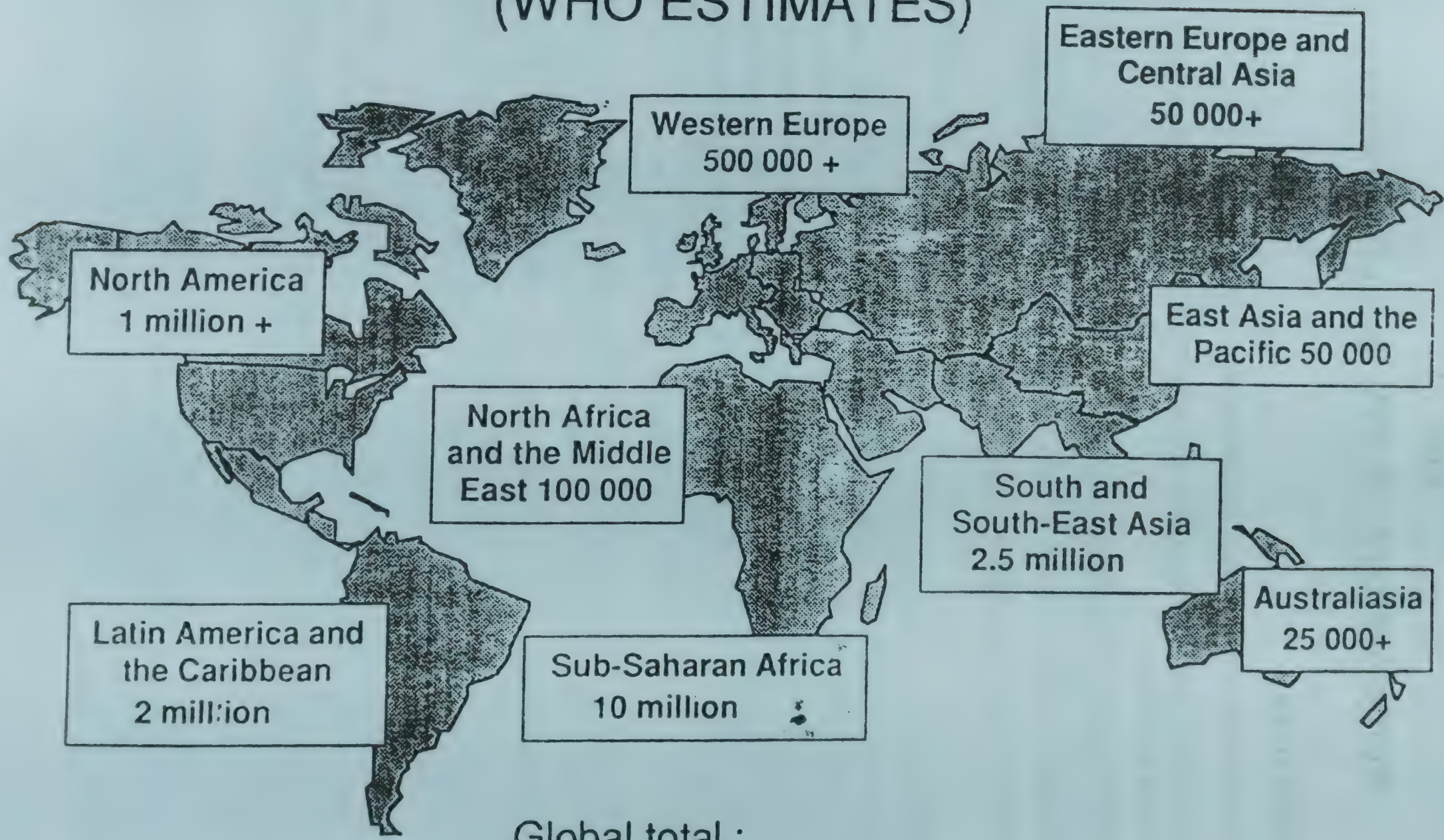
Since than the disease has become a pandemic around the globe. It has affected million of people throughout the world. Now HIV/AIDS is truly global.

By the end of 1998, according to the estimates of the Joint United Nations Programmes on HIV/AIDS (UNAIDS) and the World Health Organisation (WHO), the number of people living with HIV has gone to 33.4 millions. According to them 1600 new cases are coming up everyday. Virtually every country in the world has seen new infections in 1998.

According to UNAIDS/WHO estimates 11 men, women and children around the world were being infected per minute during 1998 (near to 6 millions). More than 95% of all HIV infected people now live with the developing world. 95% of all deaths due to HIV/AIDS have occurred in the developing world largely among the adults. Sub-Saharan Africa is home to 70% of the people who have become infected during last year 1998.

The disease which started in North-America and Europe (the developed world) is levelling off. The disease is now spreading in the Asian Continent especially in South-Asia. Well over several million Asians are already infected. HIV is clearly beginning to spread in earnest through the vast population of India and China.

HIV INFECTION – GLOBAL SCENARIO (WHO ESTIMATES)


Eastern Europe and Central Asia 50 000+
Western Europe 500 000 +
North America 1 million +
East Asia and the Pacific 50 000
North Africa and the Middle East 100 000
South and South-East Asia 2.5 million
Australiasia 25 000+
Latin America and the Caribbean 2 million
Sub-Saharan Africa 10 million

Global total :

HIV IN INDIA

Since the detection of HIV infection in commercial sex workers (C.S.Ws) in Tamil Nadu in 1986 infected number is growing very fast in the country. It is reported till September, 1999, 88775 seropositive have been reported and seropositive rate has gone upto 25.12 per thousand. The report is from 32 States and UTs in the country. AIDS cases from these has gone upto 8491. More than 80% of all infections acquired, 90% of the cases were below the age of 50 years, more than 2/3rd were between the ages of 20 to 40.

Although the magnitude of the disease varies in various parts of the country, the States of Maharashtra, Tamil Nadu, Andhra Pradesh, Karnataka and Manipur are hard hit States. Maharashtra accounts for close to 50% of all reported HIV and AIDS cases in India. Sentinel surveillance data collected during August-October, 1998 revealed that in the above mentioned States the infection in pregnant mothers, in high risk groups like STD clinic attenders, C.S.Ws, injecting drug users etc. has shown a galloping increase. Moreover, the estimated number of HIV infections in the country have been reported to be 3 to 3.5 million.

WHAT IS AIDS?

AIDS – Acquired Immuno Deficiency Syndrome

Acquired – means that it is caught as opposed to being inherited

Immuno-deficiency – describes the state in which the body's immune system is depleted so that it is unable to defend itself against the development of certain conditions, particularly infections.

Syndrome – A group of signs and symptoms of illnesses

As evident by its name, AIDS is not single disease but a syndrome i.e. a set of signs & symptoms which result from the destruction of the body's defence by HIV.

WHAT IS HIV?

H – Human

I – Immuno-deficiency

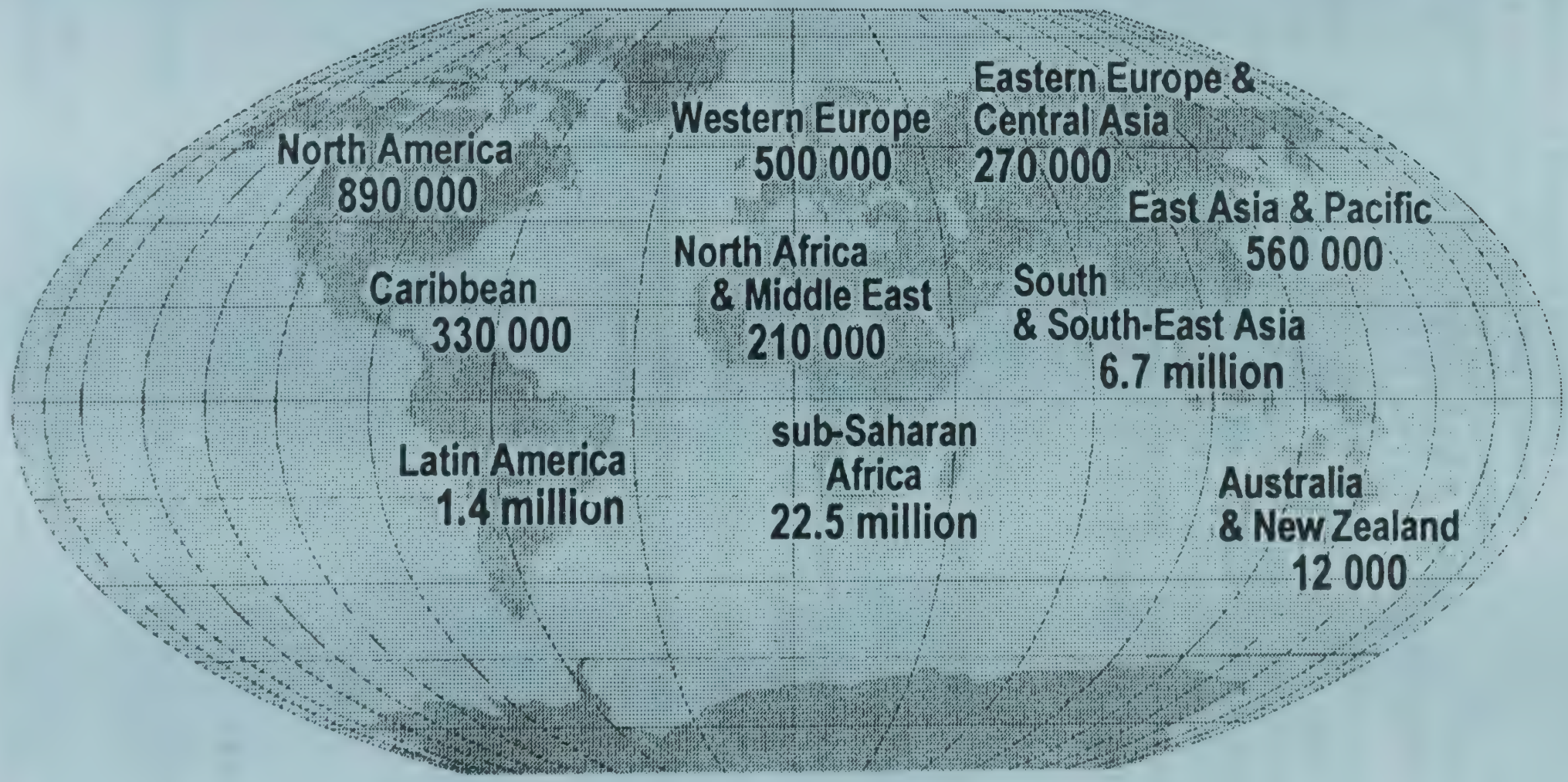
V – Virus

WHAT IS HIV POSITIVE?

The presence of antibodies against HIV in human body is termed HIV positivity and the person is called HIV positive (Seropositive).

It takes 6-12 weeks after infection for antibodies to rise to detectable levels. There is thus a window period during which infected person may transmit his infection despite being seropositive.

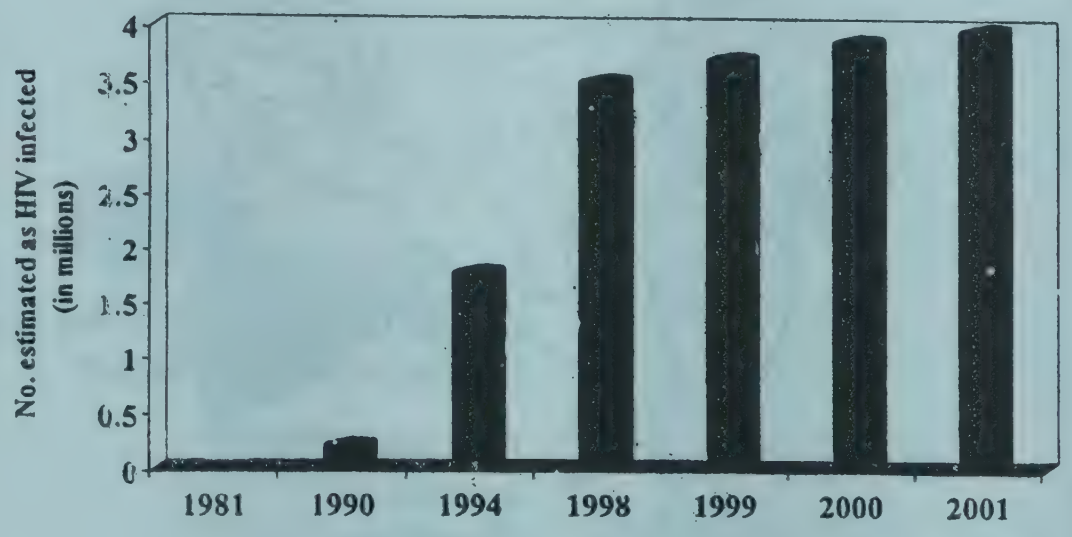
Adults and children estimated to be living with HIV/AIDS as of end 1998



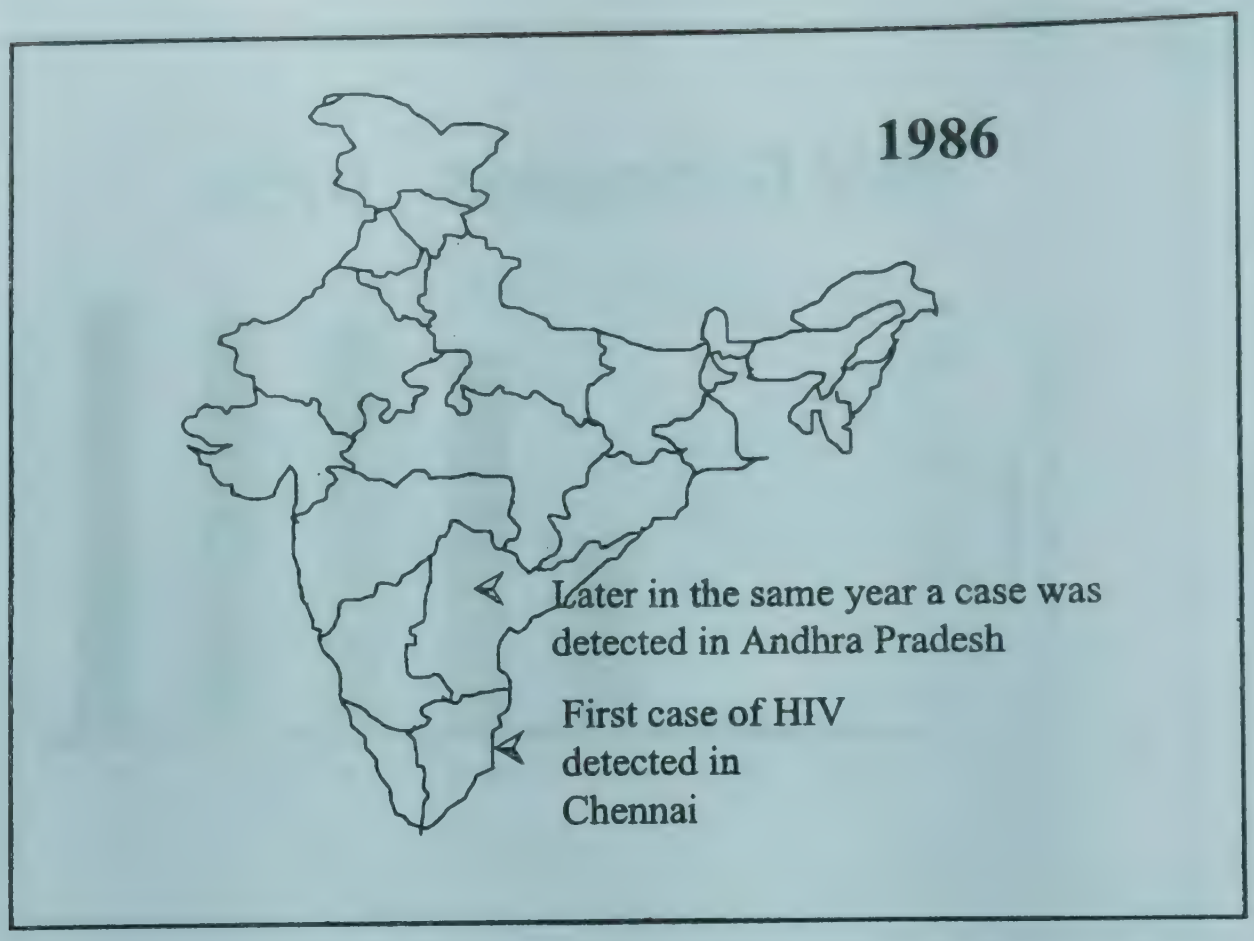
Total: 33.4 million

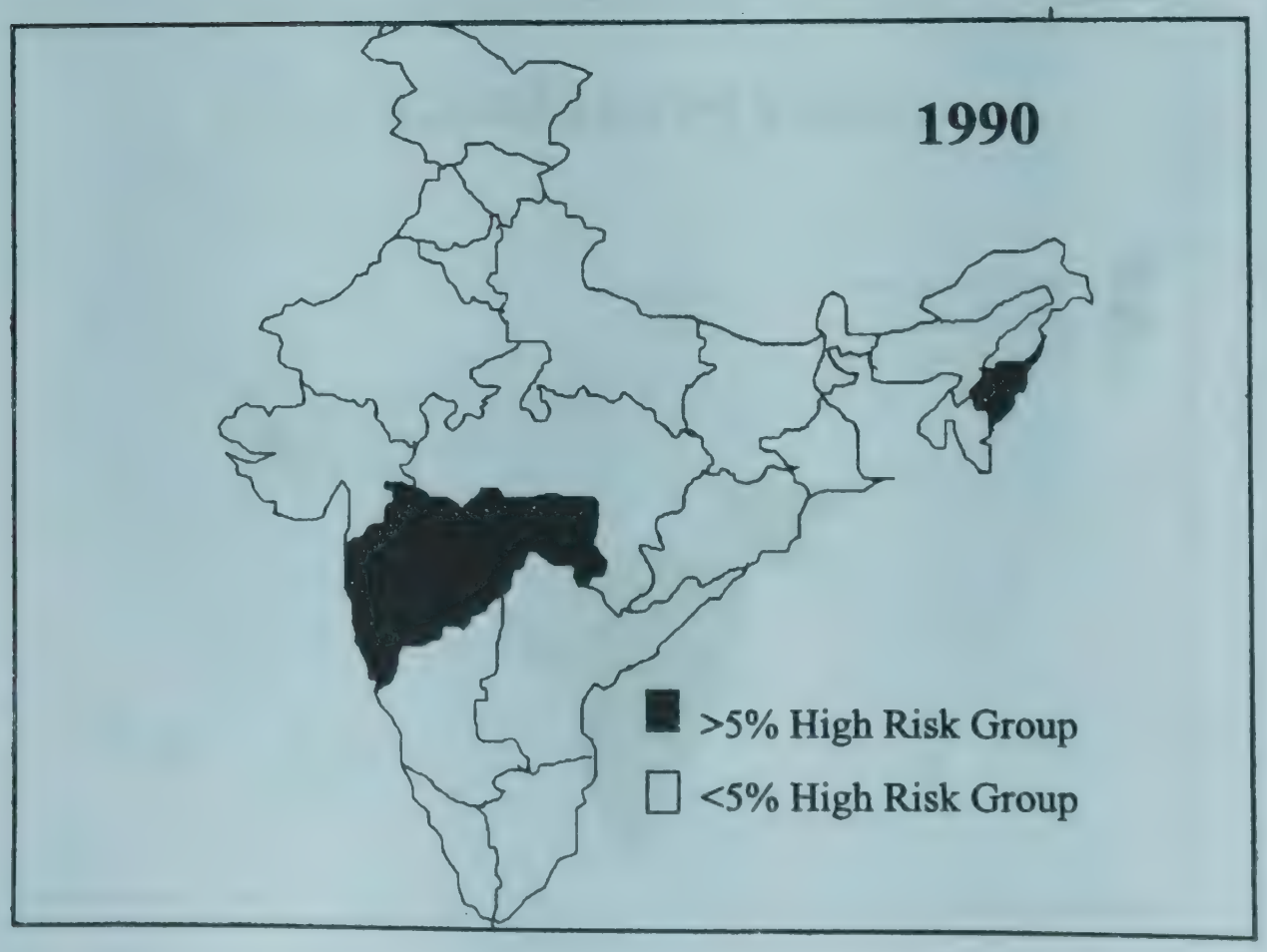
Fig. 1. HIV Infection – Global Scenario
(UNADS)
(June 1998)

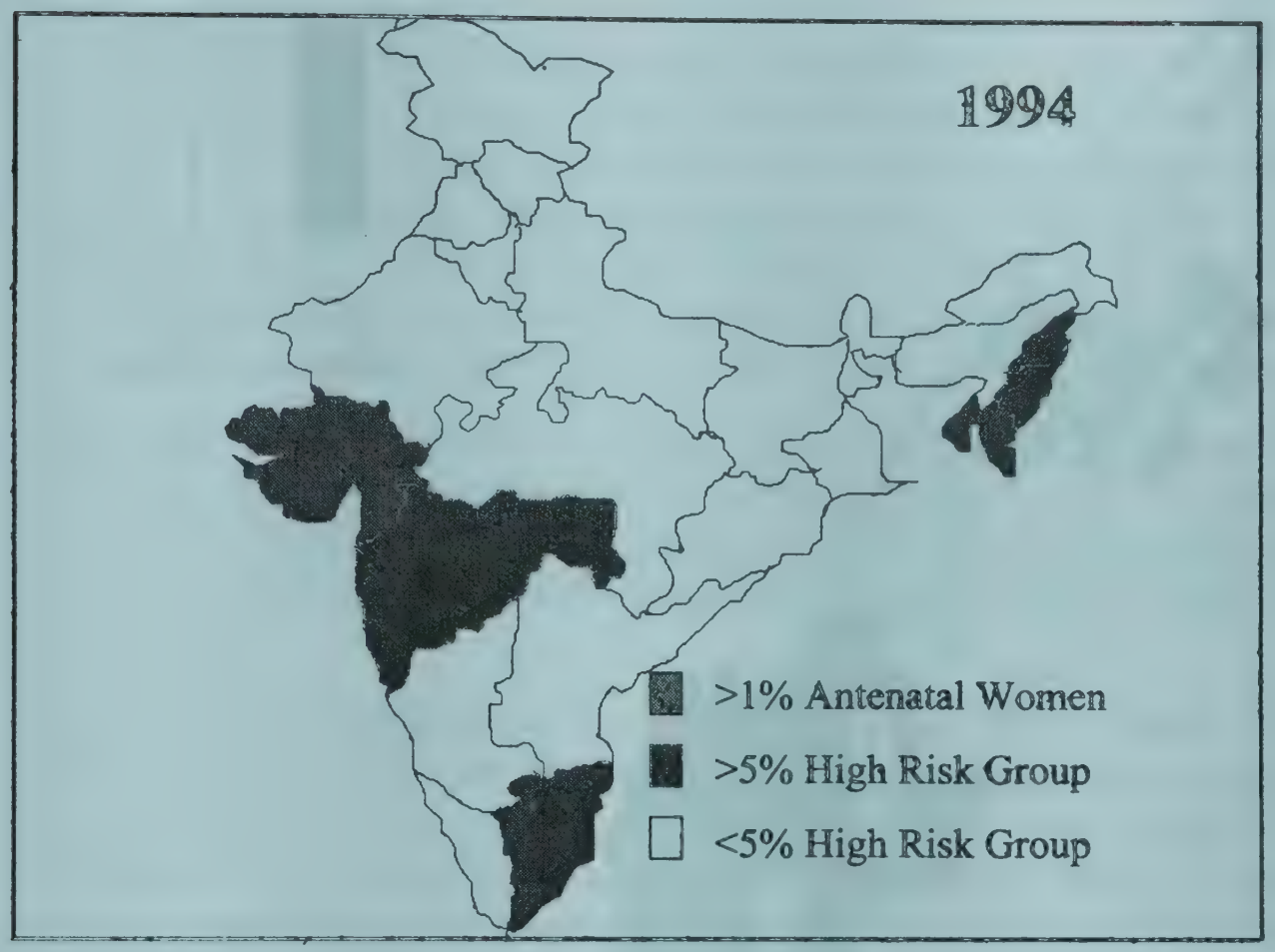
HIV Estimates : India

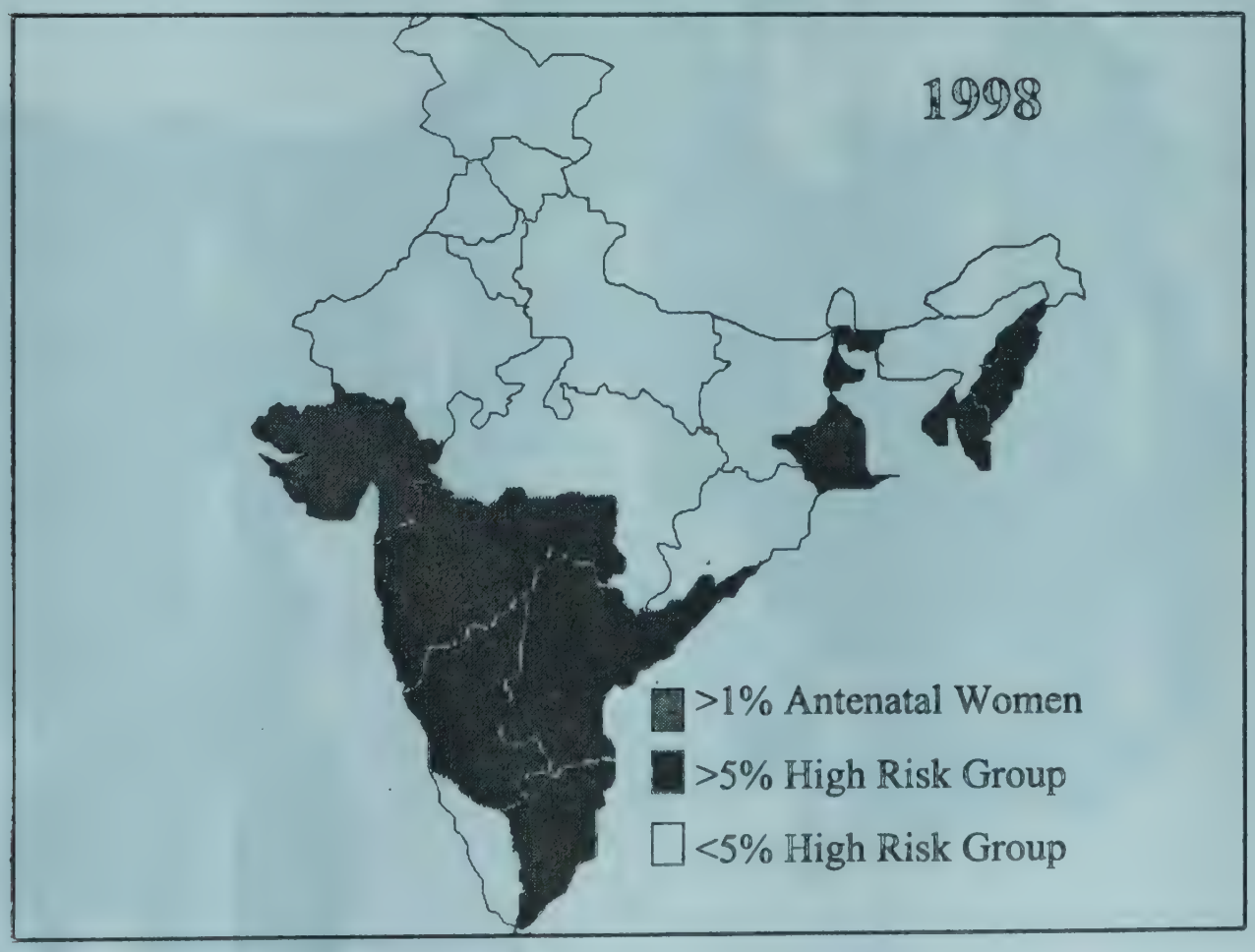


Adult Prevalence - HIV

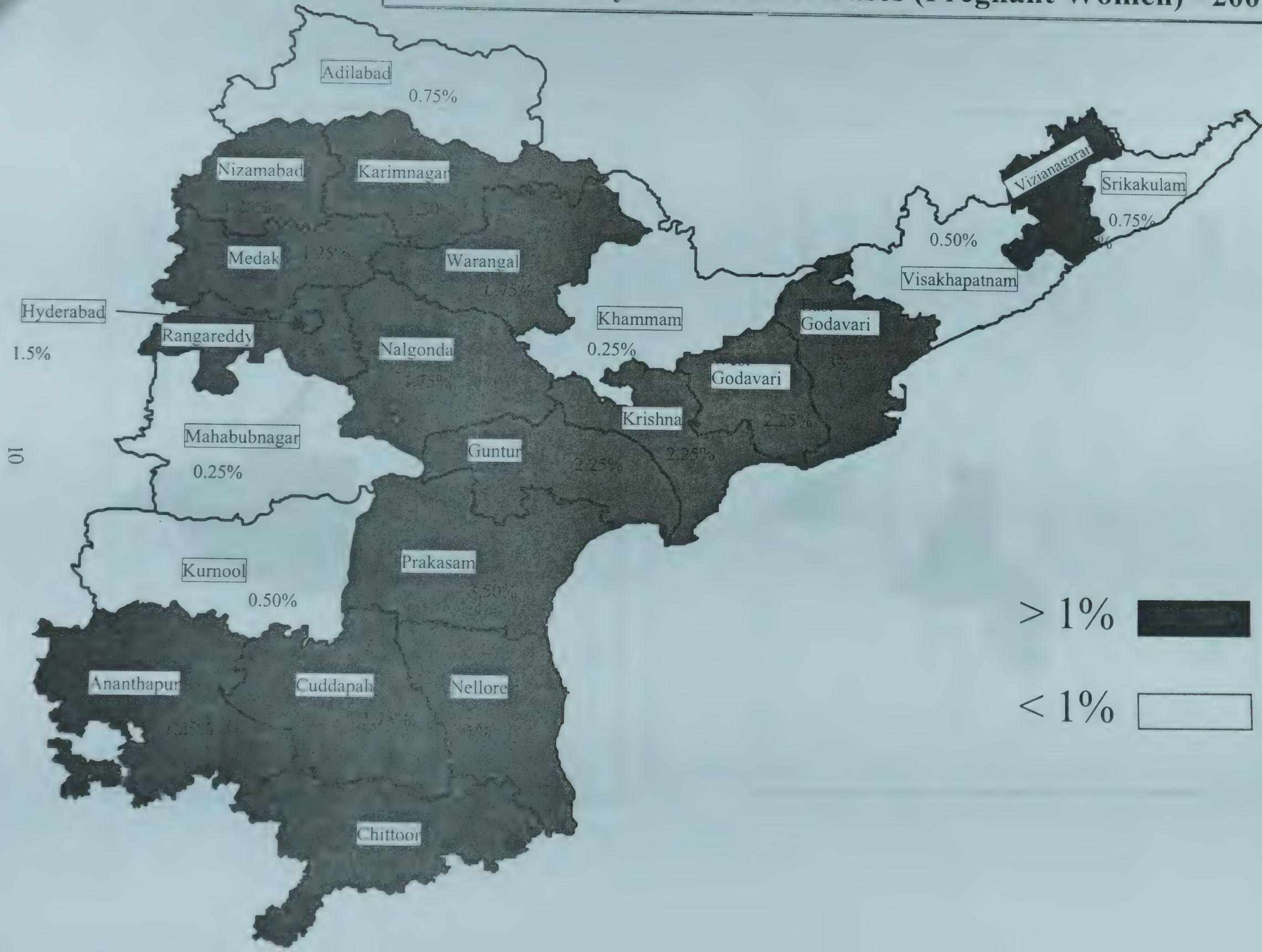

1986
Later in the same year a case was detected in Andhra Pradesh
First case of HIV detected in Chennai


1990
>5% High Risk Group
<5% High Risk Group


1994
>1% Antenatal Women
>5% High Risk Group
<5% High Risk Group


1998
>1% Antenatal Women
>5% High Risk Group
<5% High Risk Group

HIV Positivity in Antenatal Cases (Pregnant Women) - 2002



THE CAUSATIVE AGENT

The virus that causes AIDS is called Human Immuno-deficiency Virus (HIV). It was first isolated in 1983 at the Pasteur Institute in Paris practically simultaneously in NIH, Britain and USA. After few years a new virus HIV-2 identified in West Africa and has also spread all over the world. This virus is similar to the virus which was first discovered and had similar routes of transmission. AIDS virus is now called as HIV-1 and HIV-2. HIV belongs to a family of retroviruses which has been known for many years to cause a number of different diseases in animals. It contains RNA in its core, surrounded by a protein and lipid envelope or "coat" as shown in **Figure 2**.

HIV is highly fragile and is easily destroyed by boiling and steaming (autoclaving). The virus can be destroyed by various chemicals used as: disinfectants; household bleach (1 per cent), Ethanol (70 per cent), Glutaraldehyde (2 per cent), Formaldehyde (5 per cent), Sodium hypochlorite (1 per cent), hydrogen peroxide (3 per cent), Isopropyl alcohol (35 per cent), Lysol (1 per cent) and Tween 20 (2.5 per cent), solution.

This virus is mainly present in body fluids viz. blood, semen and vaginal fluids. This virus does not survive for long periods outside the body fluids, which limits the transmission of infection only to occasions when direct contact with these fluids occurs. So, the infection; is transmitted when the virus in body fluids (mainly blood, semen and vaginal fluids) comes in contact with the blood and/or mucous membranes of an exposed person. Intact skin provides a reliable barrier against HIV infection but mucous membrane does not.

This virus is also found in saliva, sweat and tears but is in such small amount that infection is generally not transmitted through these.

Fig. 2. Structure of HIV

Table 1

NATIONAL AIDS CONTROL ORGANISATION

Ministry of Health & Family Welfare, Government of India

SURVEILLANCE FOR HIV INFECTION/AIDS CASES IN INDIA

(Period of report-Since inception i.e. 1986 to 30th September, 1999).

I. HIV SERO SURVEILLANCE	*Cumulative*	*This month*
Number of persons screened	3534049	13870
Number of persons sero-positive	88775	711
Sero-Positivity Rate (Per thousand)	25.12	51.26
BREAK-UP OF SERO-POSITIVE	*Sero-Positive*	*Percentage*
Heterosexually Promiscuous	40448	45.56
Homosexuals	235	0.27
I/V Drug Users	3260	3.67
Antenatal Mothers	1118	1.26
Perinatal Transmission	88	0.09
Suspected ARC/AIDS	16077	18.11
Blood Donors	4917	5.54
Dialysis Patients	290	0.33
Recipient of Blood	1076	1.21
Others (Not Specified)	21266	23.96
II. AIDS CASE SURVEILLANCE:		
AIDS Cases in India	8491	53
Males	6684 (78.72)	44 (83.02%)
Females	1807 (21.28)	9 (16.98%)
PROBABLE SOURCE OF INFECTION	*No. of Cases*	*Percentage*
Heterosexual Promiscuous	6655	78.38
Perinatal transmission	13	0.15
Homosexual contact	36	0.42
Transfusion of blood and Blood product	571	6.72
Injectable Drug Addicts:	498	5.87
Others (Not Specified)	718	8.46
TOTAL	**8491**	**100.00**

MODES OF TRANSMISSION

Following are the modes of transmission

- Sexual intercourse (anal/vaginal) with an infected partner, (man to woman, woman to man and man to man).
- Transfusion with infected blood, blood products, organ, tissue transplantation and artificial insemination.
- Contaminated syringes and needles,
- From an infected mother to her child i.e. perinatal transmission (before, during and after delivery).

Note: Genital ulcerative STDs increase the risk of transmission many fold and are known as co-factors.

THE EFFICACY OF TRANSMISSION

Efficacy of transmission is the probabilise proportion of successful infection transmission to a susceptible host expressed as percentage.

The efficacy of transmission varies by different routes as shown in **Table 2**.

Table 2.

S.No.	Modes of transmission	Efficacy	% of infection	
			Global	India
1.	Sexual intercourse - Vaginal - Anal	0.1-1.0%	75 (60) (15)	79.0
2.	Blood transfusion	90-95%	5	7.0
3.	Perinatal	20-40%	10	0.15
4.	Injecting drug use	0.5-1.0%	10	6.0
5.	Needle type exposure (health care settings, needle stick injury, tattooing etc.)	0.5%	0.1	Not available
6.	Others (Not Specified)	—	—	8.0

Seventy five per cent of the global HIV infections have occurred through sexual intercourse (60 per cent through Vaginal and 15 per cent through anal intercourse), even though the efficacy of transmission through this route is only 0.1 per cent to 1 per cent. Anal sex carries a higher risk than vaginal. This high transmission globally through sexual route is because of the relative high frequency of sexual intercourse practised by all individuals compared to other risk practices.

In developing countries, facilities for testing of blood and blood products may not always be available. In such circumstances, or in an emergency, blood from a voluntary donor is much safer than that from a professional donor. HIV positivity is observed to be 17 times higher among professional blood donors, as compared to voluntary donors.

The HIV infection in IDUs is higher in the North Eastern States of India (Manipur, Nagaland and Mizoram).

Transmission through contaminated syringes and needles can also occur in health care settings through improperly sterilized instruments or reusing of disposable ones. Needle stick injury, tattooing with an unsterilized needle and acupuncture can also result in infection. Efficacy of transmission through this route is rather low.

TRANSMISSION THROUGH BREAST MILK

The virus is present in breast milk in very small quantities and if given for a very long time transmission through this route is suspected. It is now suggested that transmission of the virus through breast milk may be an important mode only from those mothers whose infection is of recent origin or having advanced disease.

If mother detected positive, she should be counselled for alternatives to breast milk feeding to the child.

MODES BY WHICH HIV IS NOT TRANSMITTED

It is also important to know that HIV infection is not transmitted through casual contact. In order to dispel some myths and to mitigate ostracisation and stigmatisation of infected individuals, it may be explained that HIV is not transmitted through the following Casual contact:

- Shaking hands
- Hugging
- Dry kissing
- Sneezing, coughing
- Mosquito bites
- Toilet sharing
- Sharing of telephones
- Sharing of offices
- Playing together
- Travelling together in buses & trains.
- Sharing cups or cutlery.
- Living in same room
- Donating blood aseptically

HOST FACTORS

Age & Sex

The spread of HIV infection occurs most frequently in the age group of 20 to 50 years. Globally, at the end of 1998, out of 5.8 million newly infected cases, 50 per cent were females.

Susceptibility of Infection vis-a-vis Sexual practices

- The receptive partner is at a greater risk than the insertive partner, in both vaginal and anal intercourse. Thus the risk of transmission from male to female is higher than transmission from female to male.
- Anal sex carries a higher risk than vaginal sex.
- Oral sex and deep kissing carry relatively low risk.
- A good degree of protection is provided to persons using condoms. The safety depends upon the quality of condom and its correct and regular use.

High Risk Behaviours

Based on the epidemiological characteristics of HIV infection certain high risk behaviour groups, who are likely to be harbouring infection more frequently than the general population have been identified.

- People with multiple sex partners (commercial sex workers, men who are away from their families for long periods, as they are likely to seek extra-marital sex).
- Injecting drug user, because they share needles and syringes,
- People requiring frequent transfusions of blood e.g. haemophiliacs, thalassemics etc.
- Truck drivers because of their sexual practices.

NATURAL HISTORY OF HIV INFECTION/AIDS

The natural history of any disease refers to the stages through which a disease passes, in the absence of any intervention. Clear knowledge of natural history of a disease helps in identifying the stages vis a vis appropriate intervention to prevent or control the disease.

The natural history of HIV infection begins as soon as virus enters the body of a susceptible host through any of the routes of transmission as discussed earlier (sexual, parenteral and perinatal).

Antibody test at this stage does not reveal the true status as it takes some time for formation of antibodies. Therefore, a person during this stage is not aware (even after testing) that he is infected and is capable of transmitting the virus to others. Even after the test becomes positive, the person still continues to look and feel healthy and remains asymptomatic for a number of years. Also, such a person continues to transmit infection to others, who may be unsuspecting i.e. he/she is a HIV carrier. The infectivity of the virus is thus lifelong, though it may vary with time, being high;

- In the initial stages of infection, and
- In the late stages when clinical manifestations appear.

Progression to AIDS is variable. Evidence today suggests 20% of those infected will develop AIDS in 5 years, and 50% in 10 years and a decreasing proportion even after 10 years.

Because of this long latent period in development of clear-cut clinical manifestations it is estimated that for every full blown case of AIDS, there are 3-5 with ARC (AIDS Related Complex) and 50-199 infected with the virus, but who are asymptomatic. AIDS is therefore often termed "The Hidden Epidemic". **(Fig. 3)**

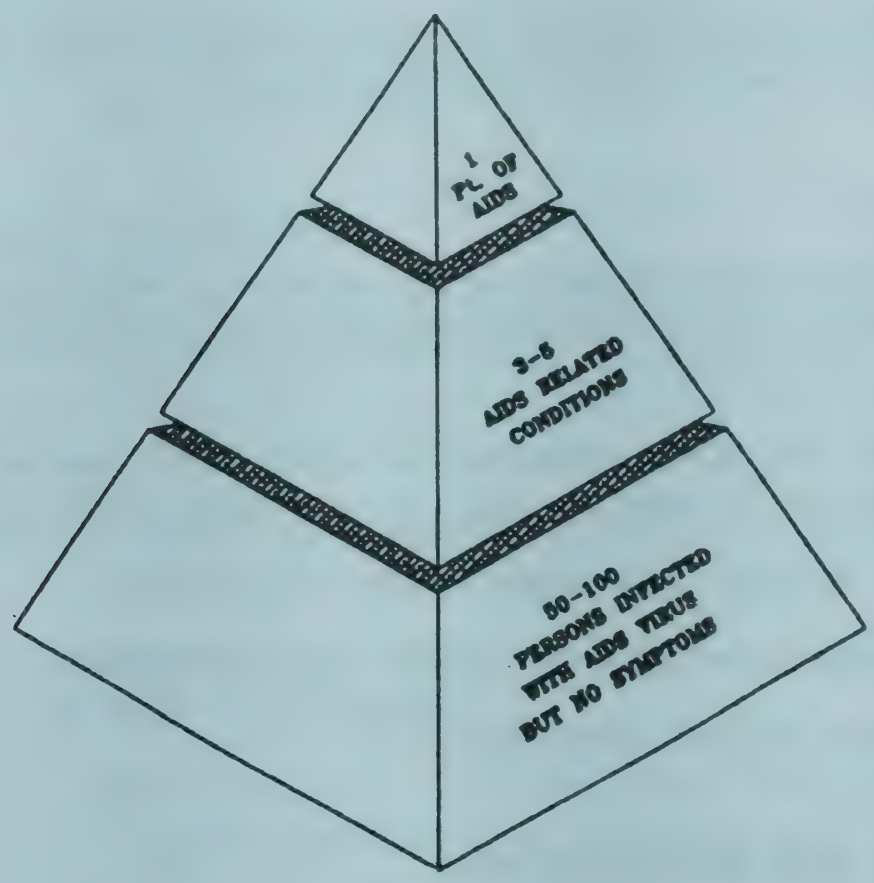


Fig. 3.

Thus, based on the clinical signs and symptoms, four distinct stages of the spectrum of HIV infection has been identified, in addition to the earliest stage of acute prodromal manifestations.

ACUTE PRODROMAL MANIFESTATIONS

Acute illness can occur as early as a few weeks after the infection is acquired, and usually precedes sero-conversion, which occurs at about 6-12 weeks. This presents typically as a glandular fever-like illness with fever, lymph[illegible]enopathy, headache, night sweats and cough which may be accompanied by a skin rash and diarrhoea. This stage being similar to so many bacterial and viral infections often tends to go unnoticed and does not arouse suspicion of HIV infection but it is present in 70-80 per cent of infected people.

STAGES OF PROGRESSION

There are four stages of progression as shown in **Fig. 4**.

STAGE 4

AIDS →

Pneumocystis carinii pneumonia

Toxoplasmosis
Kapasi's sorcoma

STAGE 3

- Persistent diarrhoea
- Weight loss more than 10%
- Fever
- Kaposi's sorcona
- Alveolar pneumonia
- Isosporiasis
- Labial/Genital herpes
- Oral candidiasis

STAGE 2

ARC (AIDS Related Conditions)

- Weight loss
- Fatigue
- Anorexia
- Oral hairy leukoplakia
- Aphthous ulcers
- Herpes zoster
- Recurrent U.R.I.

STAGE 1

Persistent Glandular hymphadenopathy (PGL)

Frequently first sign of HIV infection. Presence of enlarged nodes, at least 1 cm in diameter in two or more extrainguinal sites for at least 3 months.

Asymptomatic

Diagnosis on laboratory results alone

Acute Infection

Usually asymptomatic. Seroconversion at 6-12 weeks, sometimes accompanied by glandular fever-like illness (fever, malaise, lymphadenopathy, rash)

Fig. 4. Spectrum of HIV infection

MODE OF HIV TRANSMISSION

Epidemiological studies throughout the world have shown three modes of HIV transmission.

Sexual intercourse

Whether heterosexual or homosexual, is the major route of transmission. HIV can be transmitted through any individual act of unprotected sexual intercourse that is any penetrative sexual act where one partner is infected with HIV. The risk of becoming infected through an act of unprotected sexual intercourse depends on four main factors:

a) The likelihood that the sex partner is infected

The probability that a person has become infected with HIV is in general proportionate to the number (frequency) of unprotected sex acts and the number of high risk partners with whom the person has had sexual contact in recent years.

b) The type of sex act

All unprotected acts of sexual penetration (anal, vaginal, oral) carry a risk of HIV transmission because they bring sexual secretions directly into contact with exposed mucous membrane. Injury to the mucous membrane of the rectum, the vagina or the mouth may help the virus to enter into the blood stream. "Receptive" partners are thus at a greater risk than "Insertive" partners in acts of intercourse. However, HIV can be transmitted even through unbroken mucous membrane.

c) The amount of virus present in the blood or sexual secretions (semen, vaginal or cervical secretions) of the infected partner

Individuals with HIV infection become more infectious as they progress to HIV related diseases and AIDS. There is also an early period of high infectiousness around the time of seroconversion.

d) The presence of other sexually transmitted diseases and/or genital lesions in either partner

HIV can be transmitted sexually even when neither partner has any of the other sexually transmitted diseases. However, there is strong evidence that men and women with genital ulcer disease or urethral discharge are at increased risk of acquiring and transmitting HIV.

Blood Borne infections

HIV infected blood, blood products, transplanted organs or tissues and the use of improperly sterilized needles and syringes that have been in contact with infected blood can transmit HIV. This is the most efficient way of transmission of HIV. Even a small transfusion of infected blood results in virtually 100% seroconversion.

HIV infected woman can transmit HIV to her foetus or infant before, during, or after birth

A pregnant women with HIV infection has an approximately 30% chance of passing the virus to her foetus or newborn baby. There is evidence that infection can occur as early as the first 12-15 weeks of gestation. 60% perinatal infections are perinatal occurring during labour, or even after birth through breast milk. It is estimated that 40% of perinatal infections occur through breast feeding.

NATURAL HISTORY OF HIV/AIDS

People infected with HIV are both infected and infectious for life. Even when they look and feel healthy, they can transmit the virus to others. The signs and symptoms of infection with HIV are varied and complex. Four stages of HIV infection can be described

i) Primary infection

Infection with HIV results in rapid proliferation of the virus in blood and lymph nodes. The infected person may experience a seroconversion illness, which usually resolves within weeks. The CD4 cell count declines rapidly before virus is controlled by the immune system, whereupon the count returns to near normal.

ii) Early immune deficiency (CD4 cell count > 500/ml)

During this phase the immune system has controlled the virus, which is largely restricted to lymphoid tissue. In this phase, damage inflicted by the virus is limited to the regenerative capacity of the immune system and people with HIV are usually without symptoms.

iii) Intermediate immune deficiency (CD4 cell count 200-500/ml)

Viral replication is very high and CD4 cell turnover is rapid. Subtle signs and symptoms indicating compromise of immune system begin to appear.

iv) Advance immune deficiency (CD4 cell count < 200/ml)

The virus which proliferates throughout the body overcomes the immune system. Major opportunistic infections and malignancies become increasingly common and require increasing medical intervention.

Suspicion of AIDS in its early stages, should be aroused in all cases, presenting with

(a) Unexplained weight loss (more than 10 per cent of body weight in a year).

(b) Fever (more than 1 month).

(c) persistent generalised lymphadenopathy (PGL) in the absence of any other illness.

(d) Diarrhoea of more than one month duration.

(e) Night sweats with malaise.

(f) Aphthous ulcers or leukoplakia in the mouth.

(g) Herpes with generalised lymphadenopathy.

(h) Tuberculosis not responding to short course chemotherapy.

QUESTION

Unit - I

1. What does Acquired Immuno Deficiency syndrome mean?
2. What causes AIDS?
3. What do you mean by AIDS/HIV pandemic?
4. Who is a HIV carrier?
5. What is the latest sero-surveillance status of India?
6. Which age group is commonly affected in our country?
7. Enumerate various modes of transmission of HIV in India.
8. Enumerate modes by which HIV is not transmitted.
9. Enumerate the various stages in the natural of HIV infection.
10. Enumerate High Risk behaviour groups in your district?

Unit - II

Virological Characteristics, Immunopathogenesis and Laboratory Diagnosis of HIV Infection

LEARNING OBJECTIVES

On completion of this Unit you should be able:

- To understand the virological characteristics of Human Immuno deficiency virus.
- To understand the Immunopathogenesis of HIV infection/AIDS.
- To understand methods of laboratory diagnosis of HIV infection/AIDS.
- To know how the serum specimens are to be transferred to laboratories for diagnostic testing.

INTRODUCTION

In this unit we will discuss certain relevant details regarding the AGENT FACTORS for HIV illness in terms of the specific characteristic of the virus, how exactly it knocks down the immune system in the human body as well as how the knowledge on virological characteristics can be made use of in the laboratory diagnosis of the infection/disease.

VIROLOGICAL CHARACTERISTICS OF HUMAN IMMUNODEFICIENCY VIRUS

Human immunodeficiency virus (HIV) is a RNA virus little more than 120 mm diameter and is a member of retrovirus group which is characterised by an enzyme called reverse transcriptase (RT).

IMMUNOPATHOGENESIS OF AIDS

HIV Infections causes slow and continuous damage to the immune system primarily due to the reduction in one particular type of cells i.e. CD_4 cells which are known as the bandmaster of the immune system. This predisposes the HIV infected case to infections, particularly opportunistic infections. Death occurs due to severe infection due loss of cell mediated immunity.

COMPONENTS OF IMMUNITY

There are two arms of immunity in man. One is in the form of free antibody in blood known as humoral immunity. Such immunity is useful in fighting organisms like bacteria. Some organisms like viruses, parasites remain within the cells of the body (intercellular) and thus escape the attack of free antibody in the blood or humoral immunity. For such intercellular organisms a

different kind of immunity is effective which is known as cell mediated immunity (CMI), mediated though lymphocytes and macrophages.

CELLS INVOLVED IN HUMORAL AND CELL MEDIATED IMMUNITY

B Cells, T helper Cells, T suppressor Cells

Antibodies for immunity are produced by a type of lymphocyte known as B lymphocyte or B cells. On encounter with bacteria, B cells proliferate and produce antibody. But normally, production of antibody by the B cells is under some control mechanism as follows. Another class of lymphocyte known as T lymphocyte has got two sub-population viz. T helper or T_4 or CD_4 cells and T suppressor or T_5 or T8 cells. As their names suggest, the helper cells provide positive signal to B cells so that they can produce specific antibody and T suppressor cells suppresses the unwanted production of anti-body by B cells.

Macrophages

Macrophages are cells in blood capable of phagocytosis, a mechanism of changing its shape resulting in engulfment of organisms. This type of phagocytic cell or macrophage is useful for the protection against some parasite like Toxoplasma gondii. By virtue of its engulfment power, Toxoplasma gondii is ingested by the macrophages and then killed by its intracellular enzymes. They also process foreign antigens to initiate the immune process.

WHAT HAPPENS WHEN HIV ENTERS THE HUMAN BODY?

HIV has got selective tropism for all cells bearing the CD_4 receptor on their cell membrane, present mainly in the T helper lymphocytes (T4 cells). It is the interaction, between the gp 120 of HIV and CD_4 molecule of T4 lymphocytes that leads to the successful attachment of the virus to the T4 cells, followed by invasion. Once the virus is able to enter the T4 population, the process of immunopathogenesis begins which is described subsequently.

The various defects in immune function caused by HIV in AIDS can be summarised as follows:

TYPE OF IMMUNE FUNCTIONAL DEFECT IN CASE OF AIDS (FIG. 1)

Production of Humoral Antibody

HIV causes depletion of T helper cells leading to diminished positive signal to B cells resulting in poor production of specific antibodies. This ultimately results in different types of infection with bacteria in AIDS patients.

Cell Mediated Cytotoxicity and Natural Killer (N.K.) Cell Function

HIV causes depletion of T helper cells leading to diminished signal to T suppressor cell resulting

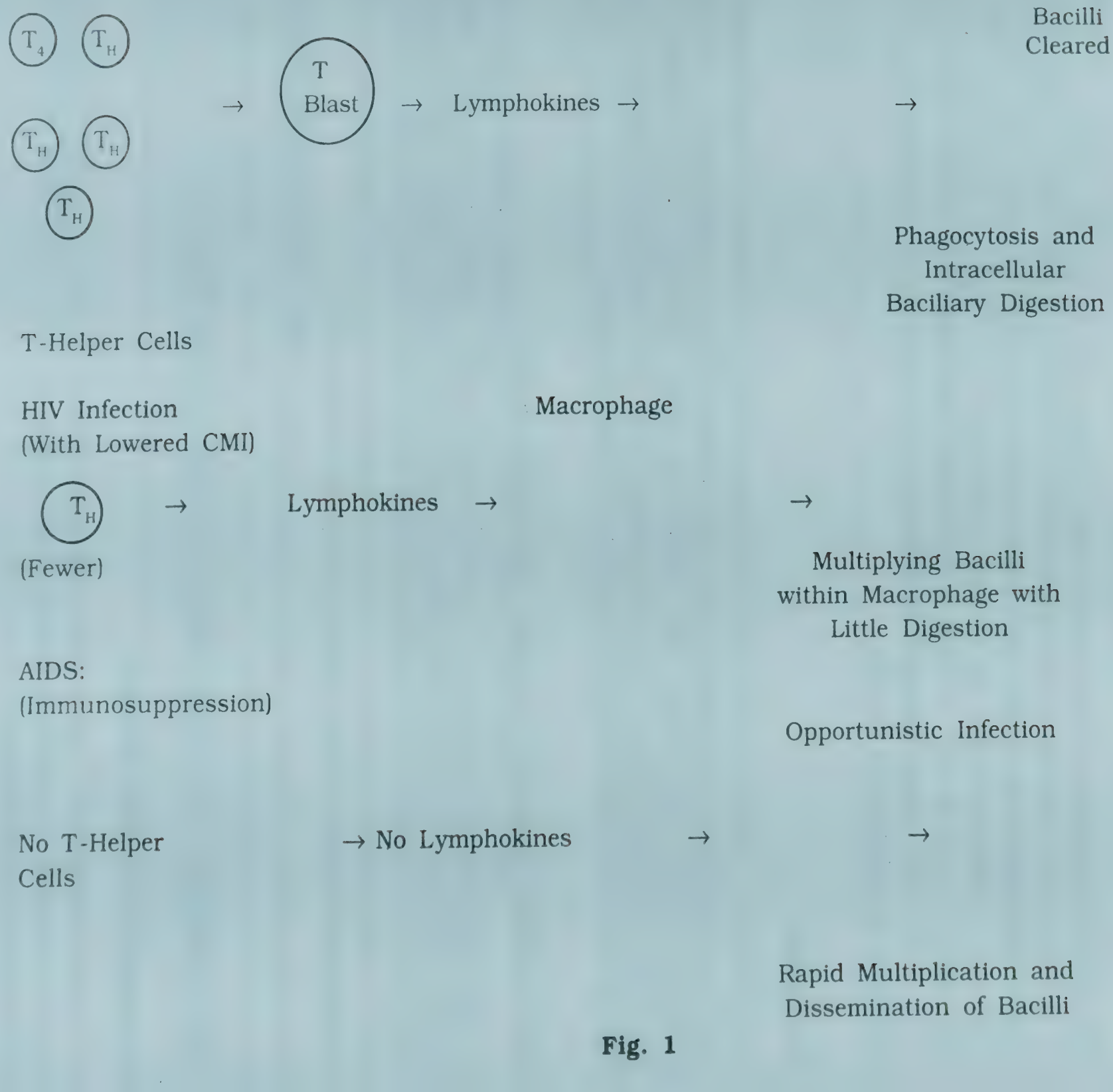

NORMAL
MACROPHAGE WITH INTRACELLULAR ACID FAST BACILLI
T_4
T_H
T_H
T_H
T_H
→
T Blast
→
Lymphokines
→
→
Bacilli Cleared
Phagocytosis and Intracellular Baciliary Digestion
T-Helper Cells
HIV Infection (With Lowered CMI)
Macrophage
T_H
→
Lymphokines
→
→
(Fewer)
Multiplying Bacilli within Macrophage with Little Digestion
AIDS: (Immunosuppression)
Opportunistic Infection
No T-Helper Cells
→ No Lymphokines
→
→
Rapid Multiplication and Dissemination of Bacilli

Fig. 1

in defective killing of intracellular virus. This ultimately results in failure to eliminate HIV and other associated viral infections.

Depletion of the helper cells also leads to diminished signals to NK Cells causing impaired defence against tumours. This ultimately results in increased prevalence of tumours e.g. Kaposi's sarcoma.

Macrophage Function

HIV Causes depletion of T helper cells leading to inadequate signals to macrophages resulting in impaired killing of organisms within macrophages. Ultimately this results in infections by organisms like, Toxoplasma gondii.

Skin Reactivity to Commonly Employed Antigens

HIV Causes depletion of T helper cells leading to non availability of T helper cells at the site of injection of antigens resulting in little release of mediators and poor response to skin test antigens.

VALIDITY OF A TEST

While assessing suitability of a diagnostic test regarding performance the following parameters assessed, namely sensitivity and specificity.

Sensitivity

It means ability of a test to identify correctly the infected persons as positives e.g. a 90% sensitivity means that 10% of samples from infected individuals could not be picked up as positive by the test (false negatives).

Specificity

It means ability of a test to identify correctly the non-infected persons as negatives e.g. a 90% specificity means 10% of samples from non-infected individuals have not been picked up as negative, but instead have been picked up as positives by the kit (false positives).

Detection of HIV Antibodies

The diagnosis of HIV infection cannot be made on a single positive test. The minimum acceptable sensitivity and specificity of the test should be 99% and 98% respectively.

For a ***diagnosis*** of asymptomatic HIV infection or when an individual is identified as HIV infected, atleast three tests by using different antigens or methods are essential.

For ***purpose of testing blood*** for HIV antibodies in transfusion only one test is recommended. If the donated blood is found HIV positive it should be discarded.

For ***surveillance*** purposes two tests either by different antigens or methods are advocated.

There are three methods used for detection of Antibodies:-

1. **Enzyme Linked Immuno Surveillance Assay (ELISA)** – it requires equipment
2. **Rapid Tests** – are visual tests and based on Enzyme Immuno Assay (EIA)
3. **Simple Test** – are agglutination tests e.g. Latex agglutination test (LAT), Gelatin particle agglutination test (GPAT), Passive haemagglutination test (PHAT).
4. **Supplemental Test** – Western Blot Test for detection of Antibodies has been used as second test in the past in this country and is highly specific and sensitive.

Both Rapid and simple tests can be done visually.

PROCEDURES FOR REFERRING SPECIMENS FOR LABORATORY DIAGNOSIS OF HIV INFECTION

For diagnosis of HIV infection, 5-6 ml. of blood of the person is collected taking aseptic precautions. The blood is allowed to clot and serum is separated. If the serum has to be transported, it must be in a screw cap bottle.

This procedure can be carried out in a Primary Health Centre.

The sample should be properly labelled.

ANNEXURE

I : List of Surveillance Centres of HIV

II : List of HIV reference centres

III : List of Zonal Blood Testing Centres

Unit - II

1. Name the cells involved in Humoral & Cell-mediated immunity?
2. What happens when HIV enters the human body?
3. Name the tests used for detection of HIV antibodies.
4. Match the following:

Purpose of Testing	**No. of Tests**
1. Blood safety	III
2. Surveillance purposes	I
3. Diagnosis of asymptomatic HIV infection	II

5. How can you confirm the diagnosis of HIV infection or AIDS?
6. How will you transfer Blood-samples to a laboratory for HIV testing?

Unit - III

Clinical Spectrum, Diagnosis and Management of AIDS

LEARNING OBJECTIVES

At the end of this Unit, you should be able to:

- Understand the clinical spectrum of AIDS in adults and children.
- Understand how to diagnose AIDS using flow chart.
- Understand how to manage the common presenting conditions of AIDS like diarrhoea, respiratory infections, neurological abnormalities, prolonged fever, associated infections etc.

INTRODUCTION

Clinical care of a person with AIDS can considerably improve his or her quality of life. Many of their sufferings can be managed in primary health care settings. In order to suspect cases and to refer them appropriately as well as to provide them curative services, it is important that you are fully aware of clinical spectrum, diagnosis and clinical management of some common presentation of AIDS.

CLINICAL SPECTRUM OF AIDS

Most of the clinical manifestations occur during the stage of advanced immune depletion. Manifestations pertaining to the different systems will be described separately, followed by opportunistic infections.

CASE DEFINITION OF AIDS (FOR PERSONS ABOVE 12 YEARS OF AGE).

i. Two positive tests for HIV infection (by E/R/S test)*

and

ii. Any one of the following criteria –

(a) Significant weight loss (> 10% of body weight) with in last one month/Cachexia (not known to be due to a condition other than HIV infection)

and

Chronic diarrhoea (intermittent or continuous) > 1 month duration
or prolonged fever (intermittent or continuous) > 1 month duration

---

*E/R/S:

E – ELISAS
R – Rapid
S – Simple

(b) Tuberculosis:

Extensive pulmonary tuberculosis, disseminated, milliary, extra-pulmonary

(c) Neurological impairment preventing independent daily activities, not known to be due to the conditions unrelated to HIV infection (e.g. trauma)

(d) Candidiasis of the oesophagus (diagnosable by oral candidiasis with odynophagia.)

(e) Clinically diagnosed life – threatening or recurrent episodes of pneumonia, with or without aetiological confirmation.

(f) Kaposi's Sarcoma

(g) Other conditions

- Cryptococcal meningitis
- Neuro Toxoplasmosis
- Cytomegabrisms (CMV) retinitis.
- Penicillium marneffei infection
- Recurrent Herpes Zoster and multi-dermatomal
- Disseminated Molluscum Contafiosum

Case definition of AIDS for Children (upto 12 years of age)

i. Two positive tests for HIV infection (by E/R/S) in children older than 18 months or confirmed maternal HIV infection for children < 18 months

AND

ii. Presence of at least two major and two minor signs in the absence of known causes of immuno – suppression.

Major signs:

(a) loss of weight or failure to thrive which is not known to be due to medical causes other than HIV infection.

(b) Chronic diarrhoea (intermittent or continuous) > 1 month duration

(c) Prolonged fever (intermittent or continuous) > 1 month duration

Minor Signs:

(a) Repeated common infections (e.g. Pneumonitis, otitis, pharyngitis etc.)

(b) Generalised lymphadenopathy

(c) Oropharyngeal candidiasis

(d) Persistent cough for more than 1 month

(e) Disseminated maculo-papular dermatitis

SYSTEMIC MANIFESTATIONS

Table 1. Gastrointestinal Manifestations and their Causes

Clinical Manifestations	Causes
Persistent diarrhoea	Bacterial Protozoal Helminth Infection with *Salmonella* species Infection with *Shigella* species *Campylobacter* infection Cryptosporidiasis *Isospora belli* infection *Mycobacterium avium/intracellulariae* complex
Dysphagia	Candida oesophagitis (90 per cent cases) herpesviral oesophagitis cytomegaloviral oesophagitis Non-specific ulcerative lesions
Perianal discomfort	herpesviral proctitis Herpesviral ulcerations Amoebic protocolitics

Table 2. Respiratory Manifestations and their Causes

Clinical Manifestation	Causes
Cough, dyspnea, cyanosis and techypnoea	Pyogenic bacteria e.g. Streptococcus pneumonia Staphylococcus, *H. influenza* *Mycobacterium tuberculosis* *Pneumocystis carinii* Atypical mycobacteria Cytomegalovirus Candida albicans Other fungal infections like *Cryptococcus, neoformans, Histoplasma capsulatum* Lymphoid interstitial pneumonitis (LIP)
Pleural effusion, hemoptysis	Tuberculosis, Malignancy (Kaposi's sarcoma) skin

Table 3. Neurological Manifestations of AIDS and their Causes

Clinical Manifestations	Causes
Headache, altered personality, lethargy, dementia, ataxia, convulsions, alteration of sensorium, disturbed coordination	HIV encephalopathy, tubercular meningitis, cryptococcal meningitis, cerebral toxoplasmosis, herpesvirus infection, Cytomegalovirus infection, Cerebral lymophoma, Vascular lesions
Meningitis	Tubercular meningitis, Cryptococcal Meningitis, Bacterial Meningitis HIV (Aseptic meningitis),
Focal neurological signs, focal seizures	Abscess/SOL: toxoplasma, tuberculosis, cryptococcus, lymphoma, vascular lesions
Peripheral neuropathy	HIV, Other viruses, Vasculitis
Visual impairment	Cytomegalovirus, Toxoplasmosis, Unknown causes

FUNGAL INFECTION

Candidasis

- Presents as oral thrush, oesophagitis or odynophagia.
- Cryptococcal Meningitis
- Other fungal infections may also occur like histoplasmosis and coccidiomycosis.

DIAGNOSIS OF AIDS

The diagnosis of AIDS, both in adults and children, is difficult under normal circumstance because the usual signs and symptoms are non-specific and resemble many common illnesses.

Clinical Signs/Symptoms used for diagnosis of symptomatic HIV disease (To be used with Flow Chart 1)

EPIDEMIOLOGIC RISK FACTORS

Past or present high risk behaviour

Drug injecting

Multiple sex partners

Male homosexual

Recent history of genital ulcer

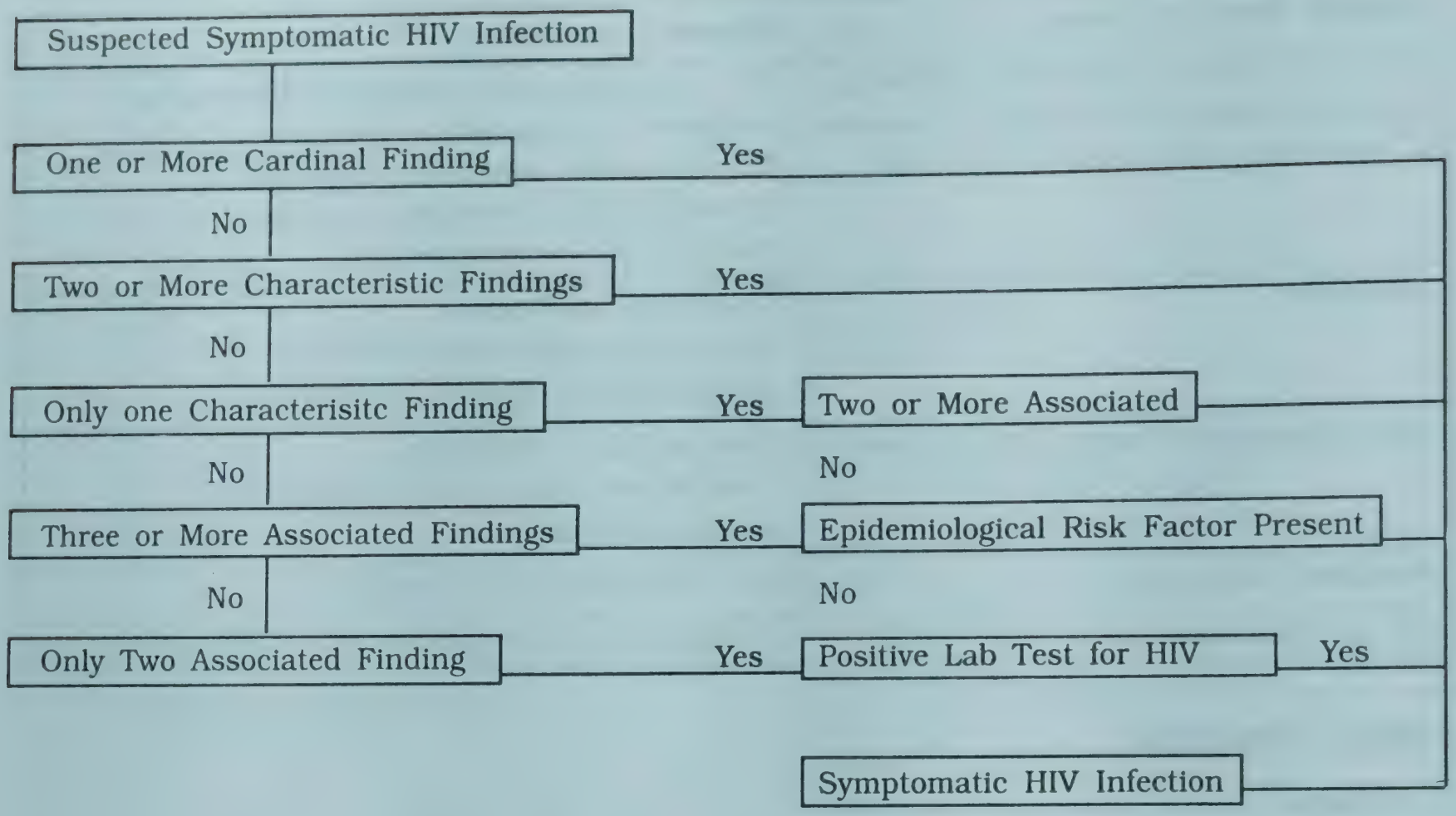
Maternal HIV seropositivity

History of receiving unscreened blood

Sexual abuse

History of use of unsterile instruments for minor procedures (like circumcision)

FLOW CHART 1



CARDINAL FINDINGS

Adults	**Children**
Kaposi's Sarcoma	Kaposi's sarcoma (rare in children)
Pneumocystis encephalitis	Pneumocystis carinii pneumonia
Toxoplasma encephalitis	Lymphoid interstitial pneumonitis (LIP)
Oesophageal candidiasis	Oesophageal candidiasis
Cytomegalovirus retinitis	

CHARACTERISTIC FINDINGS

Oral thrust	Severe prurigo (itching without lesion)
Oral hairy leukoplakia	Non-Hodgkin's lymphoma
non-cavitary pulmonary tuberculosis	Recurrent bacterial/viral infections
Cryptococcal meningitis	Miliary, extra pulmonary or non-cavitary pulmonary tuberculosis
Miliary, extrapulmonary or non-cavitary pulmonary tuberculosis	herpes zoster, past or present
Herpes zoster, esp. multidermatomal in less than 50 years	Progressive neurological disease

ASSOCIATED FINDINGS

Weight loss more than 10 per cent	Neurologic findings e.g. dementia,
Fever (continuous or intermittent) (more than 1 month)	Focal motor deficits, neuropathy,
Diarrohoea (cont/intermittent) more than 1 month	progressive headache
Generalized extrainguinal lymphadenopathy	Drug reactions (previously not seen) Failure to thrive
Skin infections (severe or recurrent)	Fever (continuous or intermittent) (more than 1 month)
Cough for more than 1 month	Generalized lymphadenopathy
	Generalized Dermatitis

MANAGEMENT OF DIARRHOEA

This plan of management is suitable for use in both adults as well as in children. The plan is described in Flow Chart 2.

FLOW CHART 2
MANAGEMENT OF DIARRHOEA

Assess Hydration

Correct Dehydration with ORS/I.V. Fluids

Stool M/E		Stood M/E not Available
Normal	Yes	Emperic Therapy TMP-SM 2B.D x 5 Days if no Response, Refer
RBC/PUS Cells	Yes	Nailidixic Acid 500 mg TDS x 5 Days (15 mg Kg/Day)
E. Listolytica or Giardia	Yes	Metronidazole 400 mg TDS x 7 Days (10 mg/Kg/Day)
OVA/Cyst of Helminths	Yes	Albendazole 400 mg Stat Repeat after 2 Wks (100 mg for Child <2 Years)

No Response in 7 days

REFER

Table 4. Assessment of Dehydration

		No Dehydration	Some Dehydration	Severe Dehydration
1.	Look: Condition	Well, Alert	Restless, Irritable	Lethargic or Unconscious, floppy
	Eyes	Normal	Sunken	Very sunken and dry
	Tears	Present	Absent	Absent
	Mouth & Tongue	Moist	Dry	very dry
	Thirst	Drinks normally not thirsty able to drink	Thirsty, drinks eagerly	Drinks poorly or not at all
2.	Feel: Skin Pinch	Goes back quickly	Goes back slowly (< 2 seconds)	Goes back very slowly (> 2 seconds)

MANAGEMENT OF RESPIRATORY SYMPTOMS

This plan of management is suitable for both adults and children. It is represented in **Flow Chart 3**.

Table 5. Assessment of Respiratory Disease

Clinical Features	Moderate Distress	Severe Distress
Dysponea	On minimal exertion	At rest
Pulse	Normal	Rapid
Ventilatory Effort	Use of Accessory Muscles	Intercostal Indrawing
Signs of Hypoxemia	Mild Cyanosis	Deep Cyanosis
Respiratory Rate (in adults)	More than normal and less than 35 per minute (in adults)	More than 35 per minute

MANAGEMENT OF PROLONGED FEVER

Flow Chart 4 can be used for the management of prolonged fever in both adults and children.

Treatment of Local/Focal Causes

- Specific treatment for focal sepsis like otitis media, sinusitis, cellulitis osteomyelitis etc. to be managed by appropriate antibiotics.

Malaria

- To be treated as per norms of the NMEP.

FLOW CHART 3

MANAGEMENT OF RESPIRATROY SYMPTOMS

SEVERE RESPIRATORY DISTRESS

- It Oxygnation not possible Refer
- Oxygen Available

X-ray Chest Sputum for AFB

Suggestive of Bacterial Infection — Yes → Ist line Treatment Ampicillin (500) QID x 10 days 500 mg TDS x 10 days
Child- TMP-SMZ 5 mg/Kg/day IV or Orally, 6 hrly.

No

Suggestive of TB — Yes → Treat as per National TB Control Programme Thiacetazone not to be given

No

Suggestive of PCP — Yes → Treat TMP-SMZ 4 tab. QID x 21 days
Child - 5 mg/Kg/dose TMP QID x 21

No

Suggestive of LIP — Yes → Oral Prednisolone 10 mg/Kg/day in dividend doses x 21 days

No

No Diagnosis Made

Refer

X-ray Chest Sputum for AFB

Response in 3 days Lower the dose to 5 mg/Kg/does 12 hrly. x 7 days

No Response in 3 Days

Refer

No Improvement

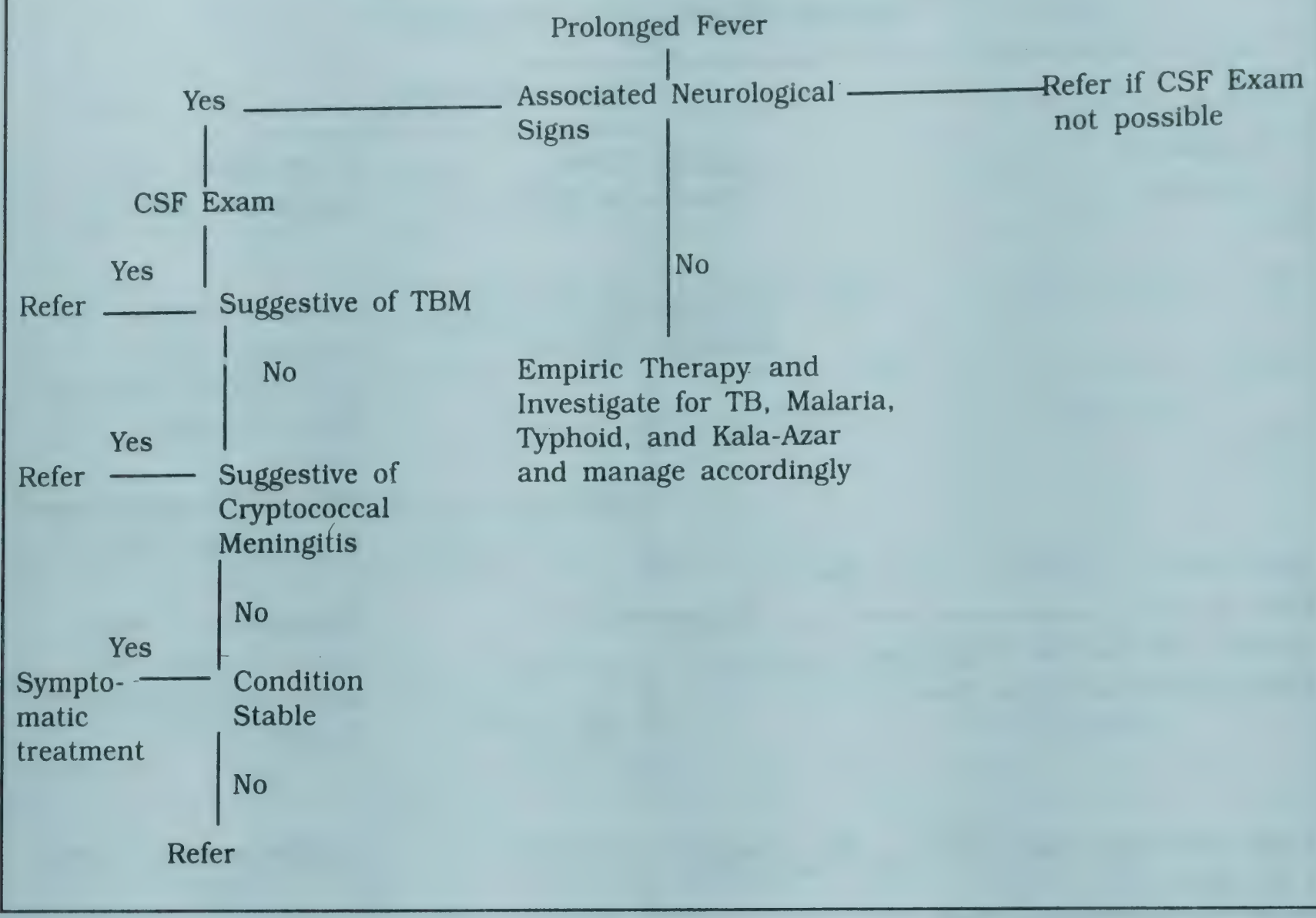
2nd line of Treatment
Adult–TMP-SMZ Oral
2 Tab. BD x 10 Days

If no improvement in 3 days

Refer

Improvement seen after 7 days
Adverse Drug Reaction Common
And may require Refcrral

Flow Chart 4
MANAGEMENT OF PROLONGED FEVER



Typhoid

- Chloramphenicol 500 mg QID x 10 days (adults) (100 mg/kg/day in 4 doses in children)
- If no response, tablet ciprofloxacin 500 mg BID x 10 days (adults) (10-20 mg/kg/day in 2 doses in children)

Kala Azar

- Ing. Sodium antimony gluconate I.V. 600 mg x 10 days
- With tuberculosis cases, Pentiamidine Isethionate 3 mg/kg/day I.V. x 10 days.

Empiric Therapy

- Most often no cause can be found and empiric therapy is required to be given.

Cap. Ampicillin 500 mg/kg/day in 4 doses (children) or Amoxycillin 500 mg TID or Tab, TMP-SMZ 2 BID (adult) or 10 mg/kg/day TMP in 2 doses (children), all required to be given for 10 days.

Symptomatic Management

- Paracetamol/aspirin in appropriate doses (3-4 doses of paracetamol 10 mg/kg/dose)
- Tepid sponging except in children

Management of Neurological Symptoms (Flow-Chart 5).

Assessment of Mental Status

Table 6. Assessment of Mental Disorders

Clinical Status	Mild Mental Impairment	Severe Mental Impairment
Personality State	Loss of concentration, mild confusion, Mild cognitive impairment	Dementia, Severe psychosis
Level of consciousness	Drowsy/Semiconscious, Responds to painful stimuli	Unconscious does not respond to painful stimuli

Neurological symptoms include:

- Alteration of personality
- headache
- Convulsions
- Alteration of sensorium
- Meningeal signs
- Cognitive defects
- Subnormal mental and motors development in children

Most cases of neurological signs especially in children, will require early referral Flow-chart[5] can be used as a guideline, both for adults and children.

TOXOPLASMOSIS

Commonest cause of focal neurologic defect; response to therapy prompt

Flow Chart 5
MANAGEMENT OF NEUROLOGICAL ABNORMALITIES

Neurological Abnormality Present

Yes

Treat for Toxoplasmosis
Adult – Pyramethamine-Loading
Dose 75 mg [Daraprime 25 mg Tab]
followed by 25-50 mg Pyramethamine
+ 8 g SDZ 7 hrly. doses x 6 weeks
Child – Pyramethamine-Loading
dose 2 mg/Kg/day x 2 day
followed by 1 mg/Kg + SDZ 6 hrly.
x 6 weeks

Refer it prompt Response not seen

Symptomatic Relif

Focal Sign Present

Acute

Refer if CSF exam not possible

No

Assoc. with Fever Meningial Signs

Yes

Refer — CSF Exam not possible

Treat
Adult – Inj. Benz. Pencillin 12-24 Million/Day
+ Chloramphenicol 2-4 gm/day in 4 hrly.
Divided doses x 10 days
Child – Inj. Benzyl Penicilline 4 Lac IV/Kg/day
+ Chloramphenicol 100 mg/Kg/day in 4 hrly.
x 10 days

Subacture Assoc. wth Fever Meningial sings

CSF suggestive of TB Meningitis

Yes

No — Treat as per Standard Practice

CSF suggestive of Cryptococcal Meningitis

Refer

Chronic Static or Progress Motor or Cognition Dysfunction

HIV Encephalopathy

CSF suggestive of Phyogenic Meningitis

No

Yes

Refer — Blood or increased CSF pressure

Treatment

- Adults: Loading dose of pyrimethamine 75 mg followed by 25-50 mg pyrimethamine plus sulphadiazine 8 gm in 4 divided doses for 6 weeks.
- Child: Loading dose of pyrimenthamine 2 mg/kg x 2 days followed by 1 mg/kg every 6 hourly for 6 weeks.
- Both adults and children require lifelong prophylaxis.

PYOGENIC MENINGITIS

Treatment

- Injection Benzyl penicillin 24 million IU/day IV and chloramphenicol 2-4 gms/day given in 4 hourly doses for 10 days (adults)
- Inj. Benzylpenicillin 4 lac IU/kg/day plus 100 mg/kg/day chloramphenicol in 4 hourly doses.

TUBERCULAR MENINGITIS

The treatment protocol is same as per standard practice for both adults and children.

Symptomatic Treatment

- Headache: aspirin/paracetamol
- Seizures: phenobarbitone/phenytoin
- Psychosis: Chlorpromazine, haloperidol
- Depression: treatment as per psychiatric management
- HIV encephalopathy: treatment as per symptoms

MANAGEMENT OF WEIGHT LOSS/FAILURE TO THRIVE

Though all the infections can cause a weight loss and failure to thrive often, HIV infection per se can lead to a sever catabolic state.

Diet

- Increase the caloric content of the food. In some cases tube feeding may be required.

Specific Treatment

- Oral and oesophageal candidiasis is one of the commonest causes of poor feeding both in adults and children and specific treatment for these often result in dramatic improvement.

If chronic diarrohoea is the cause of weight loss, it should be managed as detailed earlier. Infective conditions if appropriately treated lead to weight gain.

MANAGEMENT OF ORAL/OESOPHAGEAL CANDIDIASIS

The diagnosis of oral candidiasis is fairly straightforward based on the finding of whitish plaques on the oral mucosa which can be easily removed to reveal a bleeding surface.

Oral Thrush

- Local application of 1 per cent aqueous solution of freshly prepared gentian violet 2 times daily for 7 days is usually adequate.
- Alternatively, nystatin, 100,000 IU (either solution or pessaries crushed in glycerine) may be applied 3 times daily for 7 days.
- Relapse is common and treatment may have to be repeated many times.

Oesophageal Candidiasis

- Suspected if a patient with oral thrush and/or pharyngeal extension complains of dysphagia or odynophagia. In children symptoms include refusal of feeds and drooling.

Treatment

- Ketoconazole 200 mg BD x 5 days or
- Fluconazole 100 mg daily orally x 2 weeks

MANAGEMENT OF HIV ASSOCIATED SKIN CONDITIONS

A large number of skin conditions can occur in an HIV infected individual and many of them are amenable to therapy. A diagnosis of these conditions can be made on inspection alone and are treatable.

Bacterial Infection

Conditions like furunculosis, impetigo, pyoderma and folliculitis can be treated with systemic antibiotics like cloxacillin (250-400 mg QID for adults or 50 mg/kg/day in 4 divided doses) given orally for 7-10 days. Local application of topical antibiotic creams hastens recovery (providone iodine etc.)

Viral Infections

Herpes zoster requires local skin care to prevent secondary infection. If there is disseminated zoster, oral acyclovir 10 mg/kg 3 times a day is indicated. For herpes simplex infection besides local skin care, oral acyclovir is indicated with painful persistent lesion. Treatment has to be

given for a minimum of 7 days or till the lesions have healed. For Molluscum contagiosum the lesions need to be touched with phenol. If severe, the patient may have to be referred.

Other Conditions

Drug reactions are common in HIV infected individuals and withdrawal of the drug is required. Prurigo can be quite disabling and topical steroids and oral antihistaminics are required. Seborrohoeic dermatitis and erythroderma can be treated with topical steroid ointments.

HOME BASED MANAGEMENT OF HIV INFECTED CASE

The ultimate aim of the management of HIV infected individuals is to keep the person in the best state of physical, mental and psychological health as long as possible and to improve the quality of life. Most patients of HIV infection, even the symptomatic ones, can be very easily and effectively managed at home.

Asymptomatic Carriers

- Numbers likely to increase in coming years
- To be counselled about the risk of spread of HIV within the family
  - Transplacentally
  - Through sexual contact
- To be counselled about the need for a healthy lifestyle
  - Adequate balanced diet
  - exercise and rest
  - avoidance of intoxicants
  - avoidance of high risk behaviour

Symptomatic Patients

- Can be managed at home for a large part of their illness
- Need frequent follow-up
- Family education about
  - common conditions likely to affect the patient
  - the immediate home management of these conditions
  - the likely side effects of the medications given
  - infection control measures.

- Common symptomatic remedies to be told to family members
  - Fever: paracetamol/aspirin, tepid sponging except in children
  - Paid: paracetamol/aspirin
  - Cough: Codeine linctus or cough mixture
  - Diarrhoea: ORS
  - Vomiting: metochlorpropamide/domperidone
  - Management of wounds/sores: application of freshly prepared gention violet or providone iodine and keeping the part dry.

Terminal Care

- Best done at home
- Emotional support for the patients and family involving frank discussion of the prognosis and decisions of further treatment.
- Spiritual care.
- Nursing care to avoid soiling and wetting of bed.
- Nursing support and hydration
- Symptomatic relief of disturbing symptoms like headache, severe pain etc.

Disposal of the Deadbody

- Cremation of the dead body is the ideal method of disposal. The relatives of the dead should be counselled accordingly.
- If burial is insisted upon due to social and religious beliefs, the dead body should be wrapped first in the cloth sheet soaked in bleaching power solution and then a locally available waterproof sheet (plastic/polythene) should be used to cover the entire body over the cloth.
- The dead body should be disposed of at the earliest without any delay.
- Unwrapping and direct handling of the dead body should not be allowed even for rituals.
- Mutilations during cremation as practised in certain parts of the country are to be avoided.

Handling and disposal of blood/urine/stool/vomits/body secretions by family members

- Plenty of household plastic bags/polythene bags/tissue paper to be kept ready at bedside.
- Relatives having obvious cuts on the hand should avoid handling of body secretions.
- After handling body secretions, soap should be used liberally to wash hand.

- Soiled linen and clothes should be soaked in bleach solution for ½ hour and should be washed in usual way after that.
- Blood should be soaked in tissue paper or blotting paper and or cotton and then the paper or cotton should be burnt.
- The area of blood contamination should be mopped with bleach solution.
- Vomits/stood/urine should be flushed away after disinfection.
- Container for keeping vomits, urine and stood should be cleaned with bleach solution.

Unit – III

Please Discuss:

1. A 30 year old male presented with white patches in mouth (suggestive of oral thrush). His X-ray chest showed evidence of miliary tuberculosis. The patient had not received antibiotics or immuno suppressive drugs in immediate past. Is there sufficient evidence to label him as symptomatic HIV infection?

2. A 38 years old women was seen in the OPD for a rash of the back which was diagnosed to be Herps Zoster. Two months back she had a similar rash at another site. Neither she nor her husband were promiscuous and they have 2 healthy children. She had received 2 units of unscreened blood 10 years back for Antepartum haemorrhage. The blood was procured from a private blood bank. Is there sufficient evidence to label her as suffering from symptomatic HIV infection?

3. An eight month old female baby was seen with inability to feed and excessive salivation. The infant has lost considerable weight over the last 2 weeks. The father of infant had died 1 year back after protracted illness. The mother also kept in different health over the last 6 months. The infant was found to have extensive oral thrush, though there was no history of having received antibiotics or steroids over the last one month. Will you label the infant as suffering from symptomatic HIV infection?

4. A 29 year old male diagnosed to have symptomatic HIV infections, came with a history of profuse diarrhoea for 2 weeks, He is found to be dehydrated and also has oral thrush. How would you manage him?

5. A 16 month old baby is brought with a history of high grade fever, for 2 days, excessive crying for 1 day, alteration of sensorium for 6 hours following a generalized convulsion. He has earlier been diagnosed to have HIV symptomatic infections. On examination, he has a retraction of the neck and responds by crying to painful stimuli. What is your diagnosis and plan of management?

6. An 8 month old baby is brought with the complaints of continuous fever, fretfulness, poor feeding and not moving the right leg. The fever has been presented for over 2 weeks, On Examination, the child is found to be emaciated, has a hepatosplenomegaly and oral thrush. He has a tender inflamed swelling over the right skin, because of which the whole right lower limb is swollen. What would be your line of management?

Unit – IV

HIV Infection and Sexually Transmitted Diseases

HIV infection and sexually transmitted disease (STD) are associated with the same risk behaviour. The presence of an STDs facilitates the transmission of HIV infection. Thus, prevention and control of STD has been recognized as one of the major strategies to control the spread of HIV/ AIDS.

OBJECTIVES:

- To understand the relationship between HIV and STD.
- To diagnose, manage and prevent STD.

WHAT ARE STDS AND THEIR MAGNITUDE

STDs are a group of communicable diseases which are transmitted predominantly by sexual contact. Traditionally the following five diseases were considered as STDs.

- Gonorrhoea
- Syphilis
- Cancroid
- Lumphogranualoma venereum (LGV)
- Granuloma inguinate (GI)

STDs also include several additional diseases such as genital herpes, venereal warts, cytomegalovirus, hepatitis-B virus, pediculosis, candidiasis, trichomoniasis, nongonococcal urethritis, nonspecific genital infection and, most dreaded of them all, AIDS.

MAGNITUDE OF PROBLEM

The total annual incidence of all STDs in India is estimated around 5 per cent. Thus, it is estimated that each year approximately 40 million new infections with STDs occur. They must be treated and kept under surveillance for HIV.

RELATIONSHIP BETWEEN HIV AND STDS

(i) The predominant mode of transmission of both HIV and STD is through sexual intercourse.

(ii) The same risk behaviour which predisposes for STDs also presiposes for HIV infection. Thus, measures for the prevention of sexual transmission of HIV and STDs are the same.

(iii) STD clinic services provide an important access a point for people at high risk for both STDs and HIV infection, not only for diagnosis and treatment of STDs, but also for education and prevention.

(iv) STDs also facilitate the acquisition and transmission of HIV infection. In the presence of a genital ulcer the risk of transmission increases up to ten times while it is five folds in the presence of genital discharge. Most of the STDs causing ulcer or discharge can easily be cured.

(v) Trends in STD incidence and prevalence can be used as indicators of changes in sexual behaviour. Such trends are easier to monitor than the trends of HIV transmission and can therefore be used to determine the impact of HIV control programme.

SOME SYMPTOMS OF STDS

Many STDs show early symptoms which disappear without treatment. But the causative agents remain in the body, causing damage to different organs. Some STDs have mild or no symptoms at all, particularly in women. One with an STD may look and feel healthy but can still infect partners or unborn babies.

SOME SYMPTOMS OF STDS

Women	Unusual discharge or foul smell from the vagina, Pain in the lower abdomen Burning or itching around the vagina, pain during sexual intercourse.
Both Men & Women	Sores, bumps, blisters or rashes in or near the sex organs or mouth Burning pain while passing urine or having bowel movement. Swelling or redness in the throat, fever, chills and aches-like flue, Swelling in the groin.
Men	A drip or discharge from the penis

FACTORS CONTRIBUTING TO THE MAGNITUDE OF THE STDs PROBLEM:

(i) Many STDs are asymptomatic

(ii) Awareness about signs and symptoms and the importance of STDs treatment is poor

(iii) Failure to treat patients effectively

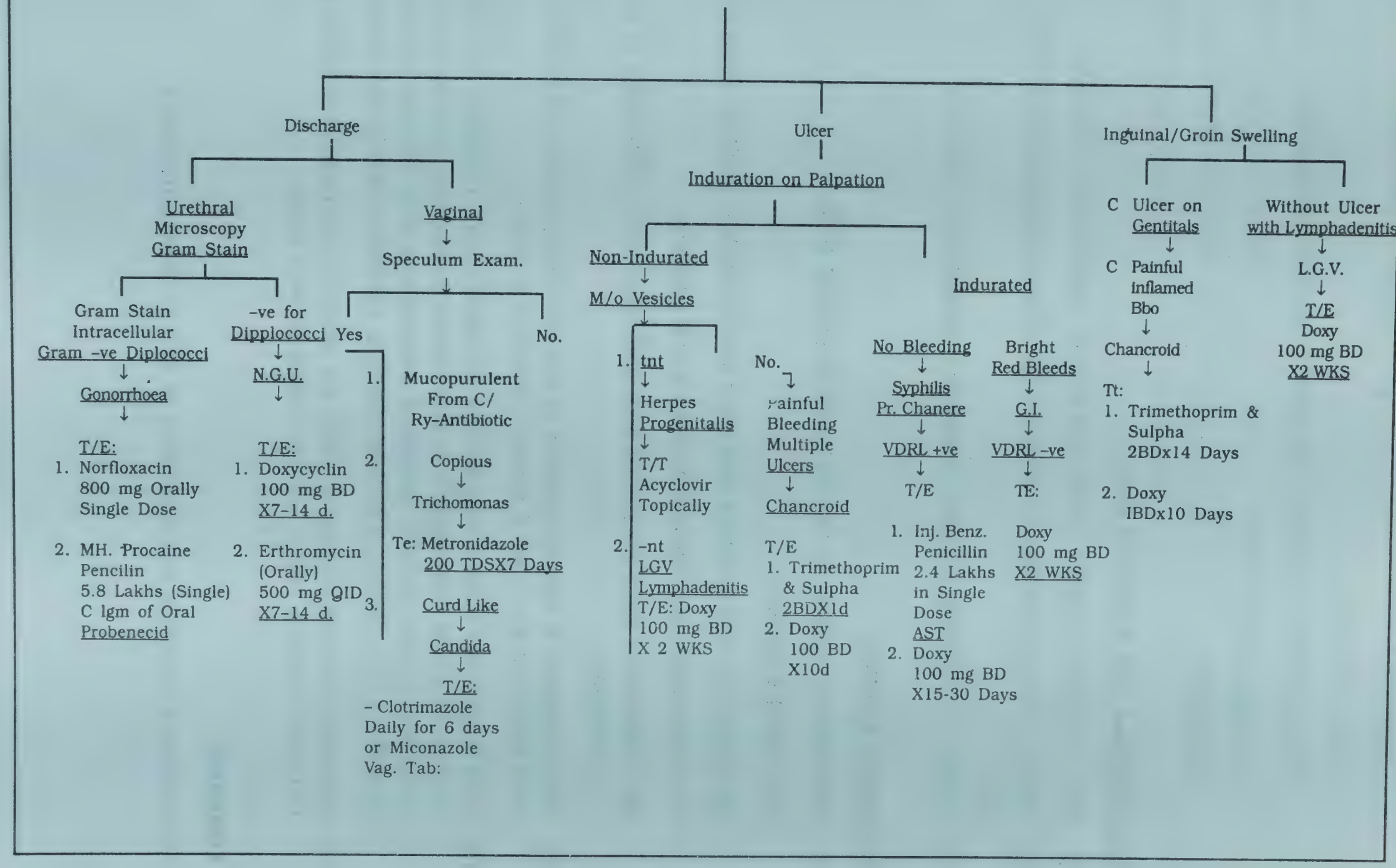
(iv) Failure to get the partners treated simultaneously

(v) Failure to promote preventive measures

(vi) A number of social factors also contribute to the spread of STD, namely :

- Urbanisation and Industrialization

Chart I
Simplified Diagnosis & Treatment of STDs
(History of Sexual Contacts)



- Migration/Travel
- Social disruption
- Socio-economic problems and lack of economic opportunities
- Changing social values
- Alcoholism

Complications and Sequel of STDs

(i) Men - Urethral stricture, acute and chronic epididymitis, Infertility

(ii) Women - Pelvic inflammatory disease (PID), Ectopic pregnancy, infertility, chronic abdominal pain.

(iii) Infants - Congenital syphilis, ophthalmia neonatorum, blindness.

Prevention of STDs

(i) The following guidelines can do much to prevent STDs.

(a) Use of Condoms

(b) Avoid sex with partners who have genital rashes, redness, sores or discharge.

(c) Stay away from casual sex/Reduce sex partners.

(d) Urinate and wash the genital area after intercourse. This helps in avoiding some genital infections.

(ii) Early treatment is always desirable to prevent complications and further spread of infection. Most STDs can be cured if correct treatment is given.

(iii) Good quality, non-stigmatising services for diagnosis and treatment of STDs should be provided through STD case management in the existing health care system, in an integrated manner. Collaboration with private, industrial corporations and NGO sectors and re-orientation of specialised STD clinics to become training, referral, research and monitoring centres.

(iv) Screening and case findings for STD, for instance a) screening of mothers in antenatal clinic b) Contact Tracing and c) Cluster testing of STD cases.

Treatment

The simplified Diagnosis and Treatment of STD is shown in Chart-I.

Unit - IV

1. What are similarities between STD and HIV infection?
2. Are STDs a serious problem in India?
3. What are the contributory factors for STDs?
4. Suggest guidelines for prevention of STDs in your district.

Unit - V

HIV Infection and Tuberculosis

LEARNING OBJECTIVES

At the end of this Unit, you should be able

- To understand the relationship between HIV infection and tuberculosis.
- To understand he clinical picture of tuberculosis in HIV infected cases.
- To understand the policy of BCG vaccination.

INTRODUCTION

It is now increasingly recognised that there exists a synergistic relationship between tuberculosis and HIV infection. It has been observed that the disease is much more likely to develop in persons infected with *Mycobacterium tuberculosis* who acquire HIV infection than in their tuberculin positive counterparts who do not have the HIV infection. Also, it has been observed that HIV infected individuals exposed to tuberculosis are more likely to have a rapidly progressive primary disease instead of sub-clinical infection.

In HIV infected persons because of immuno deficiency there is increased incidence of tuberculosis by the following ways:

- Reactivation of quiescent focus.
- Progression of recent infection to disease.
- Super-infection

The degree of HIV induced immuno-suppression required to reactivate healed tuberculous lesions appears to be less than that needed to help opportunistic infections. Thus, pulmonary tuberculosis is often diagnosed first in persons who do not have other evidences of HIV induced immuno-suppression. Diagnosis of tuberculosis/extrapulmonary tuberculosis if found associated with a positive serological test (ELISA) for HIV infection is now regarded sufficient proof of the patient having AIDS.

CLINICAL PICTURE

There are two distinct clinical patterns

- When tuberculosis develops in earlier stage of HIV infection, the features of tuberculosis is indistinguishable from ordinary disease as in non-HIV infected individuals.
- When tuberculosis complicates the late stage of HIV infection just before or even after the onset of AIDS, the clinical and radiological features differ from those in non-HIV infected

patients. These differences are

- Tuberculin test is often negative
- Majority of cases present as extra pulmonary tuberculosis – In cases of pulmonary tuberculosis middle & lower lobes are affected more as compared to upper lobe with enlargement of paratrcheal or hilar lymphnodes.
- The biopsy of lymph nodes will show no caseation, and lymphocytes, giant cells and epithetial cells will be seen.

TREATMENT

For pulmonary and extra-pulmonary tuberculosis, short course chemotherapy should be given for the minimum of 9 months which must include Rifampicin & INH. In case, patient is not responding after 6 weeks, add one more bactericidal drug.

POLICY OF BCG VACCINATION

BCG vaccination should be given to all new born. It should not be given in any symptomatic HIV infected infant as it may result in fulminating disease.

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Unit - V

1. A 30 year old man truck driver presents with cough, chest pain, breathing difficulty since 4 weeks. What will be you line of management?
2. Patient is diagnosed as HIV positive with extra-pulmonary tuberculosis. He is not responding to short-course chemotherapy. What will you do?
3. An infant is born to an HIV positive mother. Will you advise BCG vaccination?

Unit - VI

Surveillance for HIV infection and AIDS

Surveillance activities under the National AIDS Control Programme includes:

1. Surveillance of HIV infection
2. Surveillance for AIDS

LEARNING OBJECTIVES

After going through this unit you as a Medical Officer will be able to

- define the term surveillance and understand how surveillance for HIV infection/AIDS differs from surveillance for other diseases;
- understand and explain the purpose of HIV testing in different situations;
- Interpret the given surveillance data on HIV infection/AIDS;
- have knowledge of HIV testing in your district and state;
- use available surveillance data to plan and organise AIDS prevention activities in your area.

INTRODUCTION

In order to meet the challenge of HIV infection epidemic in the country, a reliable information system is needed on the prevalence and distribution of the infection in various groups and geographical areas, as well as the trends of infection over a time period. The acquisition of such information, interpretation and timely action is what constitutes the surveillance strategy under the National AIDS Control Programme.

SURVEILLANCE OF HIV INFECTION

Surveillance can be defined as collection of accurate and complete epidemiological information regarding distribution and spread of infection in a given geographical area over a time period. Valuable information about the disease pattern which forms the basic determinant for health care planning and management is generated through surveillance.

In diseases like poliomyelitis and viral hepatitis, surveillance data is used to initiate containment measures, the interventions are directed towards patient, contacts, family, the community at large.

However in the case of HIV infection, purpose of surveillance is to measure HIV infection trends and not to carry out any intervention directed at the individual. Purpose of HIV surveillance is to measure the level and trends of HIV infection in a given geographic area over a time period.

At present there is no cure or vaccine to prevent HIV infection/AIDS. At a time, when no solution can be offered to an individual who is HIV positive, an attempt has to be made to prevent further transmission. Such preventive strategies, will have to be focused and targeted to those who have increased risk of getting HIV infection. The main intervention available so far is prevention by education of the:

i) High risk behaviour groups

- Commercial sex workers;
- Professional blood donors;
- Individual sharing infected needles;

ii) High risk population groups

- STD patients
- Spouse of HIV infected person
- Recipient of blood/blood products/dialysis

SURVEILLANCE FOR HIV INFECTION

The existing HIV surveillance mechanism in India is based on sero-surveillance i.e. screening of blood from identified groups of individuals for HIV antibodies. A sentinel surveillance methodology is set up in different states wherein a few selected groups in populations viz. C.S.W.'s, STD patients, antenatal mothers, IVD users etc. are screened for HIV prevalence to see the epidemic trends over a period of time.

Conventionally-a sentinel centre is an institution that is getting large number of cases suffering from the disease under surveillance and have got diagnostic facilities and are reporting to the health authorities on time and regularly. Recommended sentinel HIV surveillance should preferably be clinic based as it provides opportunities for unlinked anonymous testing.

Surveillance data in the country is based on HIV sero-positivity that has been observed by known risk behaviour such as:

- Patients attending STD clinics
- Commercial sex workers;
- IV Drug user
- Frequent recipients of blood and blood products
- Professional blood Donors.

It is important to note that it is the donated blood unit that is tested and not the donor. The available data on donated blood screening is analysed and used to assess the HIV prevalence among this group.

In addition, as a part of the surveillance strategy pregnant women attending ante-natal clinics are also screened primarily to know the extent to which the infection has percolated in the population.

Surveillance of HIV Infection is a epidemiological tool to see how the HIV epidemic in behaving in the community. At present, if the initial test is found to be positive, the sample is retested by a different Antigen.

OBJECTIVES OF HIV TESTING

The four key objectives of HIV testing include:

- Transfusion safety;
- Surveillance and research;
- Diagnosis of HIV infection; and
- Diagnosis of AIDS.

TYPES OF TESTING

Blood Tested for HIV No Identity Mark	:	Unlinked Anonymous Testing
Blood Test Code given	:	Voluntary Confidential Testing
Results Identified Known to few persons	:	Voluntary Confidential Testing
Blood/Body Fluid & Tissues Test Result Known	:	Mandatory Testing
Blood Test Compulsory, No choice Result may or may not be given	:	Compulsory Testing

In unlinked anonymous testing, the need for counselling does not arise. Wherever an individual is likely to be identified as positive or negative, Pre-test and post-test counselling is a must-both for voluntary and anonymous HIV testing. The details of counselling are discussed in the unit on counselling.

In case an individual is going to be identified as positive or negative, maintaining confidentiality is a must.

IMPORTANCE OF CONFIDENTIALITY

The important facts to be remembered in this regard are:

- HIV/AIDS affected individuals deserve the same dignity and human rights as any other person.
- HIV test of any individual is not to be conducted without his/her consent unless all identification features of the individual are eliminated from the specimen.
- Experience of various countries where tests were applied to special groups like factory

workers, professional donor, commercial donors, commercial sexworkers and their identity was disclosed has led to discrimination against the affected. Some of them lost their jobs, friends, family life, and even got divorced. They were discriminated against for every aspect of life.

- Since professional blood donors and commercial sex, workers have no other source of income, and when found sero positive, they are likely to go underground or move to new areas for the fear of being boycotted from society.
- Since there is no infrastructure to rehabilitate the HIV/AIDS affected, maintaining confidentiality is absolutely essential to ensure care at home in the family as well as in the community.

AIDS CASE SURVEILLANCE

Guidelines for the AIDS Case surveillance

Introduction

In the Strategic Plan for AIDS Prevention and Control in India it is indicated that the collection, analysis and dissemination of data relevant to the control of AIDS would be the responsibility of the National AIDS Control Organization. Case reporting forms for AIDS, assuring strict confidentiality has been developed.

The passive/hospital institution based surveillance will be coordinated by the State AIDS Programme Officers who are responsible for planning and coordinating the activities related to AIDS case surveillance, and by the administration of the hospitals involved. The State Programme Officer will be technically assisted by the AIDS-Case Surveillance Coordinator (A.S.C.) and person responsible for AIDS case Management (PRAM) specially designated for this purpose.

Objectives

General

a) To establish AIDS-case surveillance in all medical institutions of the country.

Specific

a) To improve identification of AIDS cases among persons applying for medical aid, and reporting.

b) To establish referral system for suspect AIDS-cases.

(c) To monitor the AIDS epidemic.

Institutions Involved

The surveillance activities are coordinated at the national level by NACO and at State level by State AIDS Central Societies (SACS).

The surveillance is conducted in all medical institutions identified for this purpose.

According to the activities, the health institutions involved in the surveillance are divided into two categories.

1) The institutions which identify suspect AIDS cases, and diagnose AIDS provisionally are called "non-referral institutions", and this category includes all medical service units (in and out-patient).

2) The institutions confirming AIDS diagnosis are called "referral institutions". An identified physician in each referral hospital, called PRAM will confirm suspect case referred to this hospital, and prepare technical reports on AIDS patients.

As the problem rises the network of referral institution would be expanded, to include, at the first stage, all central district hospitals and general city hospitals with 200 and more beds.

Approach to the Diagnosis of the AIDS

At the district and sub-divisional hospitals, private hospitals and in-patient services of various institutions as well as at the primary health centres the Indian definition will be used for suspected AIDS cases. (Unit III)

No matter how typically a case may seem to resemble AIDS, every attempt should be made to arrange for a comprehensive clinical, physical and laboratory investigations of the patient. It should be remembered that AIDS should never be a first in diagnosis since erroneous labelling of an individual patient can lead to grave consequences.

The referral system for AIDS diagnosis is shown in Table I, person suspected to have developed AIDS, in the opinion of any medical worker, will be referred to any nearest hospital. In case the investigation in this hospital, supports the provisional diagnosis, the patient will be referred to the PRAM in the referral hospital. In case the patient cannot reach the referral hospital, his/her referral record and a sample of serum will be sent to the respective PRAM for consultation and diagnosis.

Suspected AIDS patients referred to a PRAM, will undergo additional medical examinations, available at the hospital including HIV testing. The patient with confirmed AIDS diagnosis, after counselling and treatment, will return to his/her original residence with the recommendations on home care and further counselling for the non-referral institution staff.

All non-referral institution will use the Indian case definition. (Unit III)

Table 1. Referral System for AIDS Diagnosis

Personnel	Institution	Activity
All Medical workers	All health institutions	Identifying suspect AIDS, cases on the basis of the Indian case definition. Refer to the nearest hospital.
Physician	Non-referral institutions	Investigate the patient in order to negate or support provisional diagnosis. Refer to the referral hospital.
Physician responsible for AIDS case Management (PRAM)	Referral hospital	Investigate the patient and diagnose AIDS on the basis of Indian case definition and HIV test results. Refer confirmed cases to the original hospital. Report confirmed cases to the State AIDS Programme Officer.
PRAM	Referral hospital with advanced diagnostic facilities	Investigate and diagnose AIDS on the basis of the Indian case definition. Refer confirmed patients to the original hospital. Report confirmed cases to the State AIDS Programme Officer.

Unit - VI

1. What do you understand by surveillance for HIV?
2. Whom do you screen for HIV Testing?
3. Enumerate the key objectives of HIV Testing.
4. What are different types of testing in relation to recording identification and disclosing results of HIV testing?
5. What is the importance of confidentiality?
6. Interpret the surveillance data on HIV infections/AIDS in your state/district. Develop a surveillance plan for your area.

Unit - VII

Safety of Blood and Blood Products

LEARNING OBJECTIVES

On completion of this unit you should be able:

- To acquire knowledge of blood borne diseases and safe blood transfusion.
- To acquire knowledge on the various facts and myths regarding blood transfusion.
- To ensure the appropriate use of blood.

INTRODUCTION

Availability of safe blood and blood products is a basic requirement of health care programmes. Blood transfusion has undoubted benefits, but it also carries serious risks including the possibility of transmission of infectious agents e.g. Hepatitis-B, Syphilis, Malaria and AIDS. Efficiency of transmission of HIV through blood is more than 90% hence ALL the blood MUST BE TESTED for presence of HIV antibodies before transfusion. In order to reduce the risk of HIV transmission by blood transfusion it is important to advocate the policy of fewer transfusions, safe donors and safe blood for transfusions.

There is overall shortage of blood in blood banks as there is no regular and sustained blood collection from voluntary blood donors.

The blood banks should have facilities/provision for carrying out following four mandatory tests for blood transmissible infections:

1. Hepatitis B Screening
2. HIV antibody testing
3. VDRL/RPR test for Syphilis.
4. Test for Malaria

SOME FACTS AND MYTHS ABOUT BLOOD TRANSFUSION

Facts

1. There must always be sound reason for blood transfusion in any patient.
   (a) Blood transfusion is indicated when blood loss exceeds 30% particularly in patients with massive internal or external haemorrhage.
   (b) When the estimated blood loss is between 20-30% plasma expanders (crystalloids or colloids) can be substituted for blood.
   (c) An adult can tolerate loss of blood upto 20% without blood transfusion.

2. In adults one unit of blood (350 ml) will increase the haemoglobin upto 1 gm %.
3. The collected blood can be used within 28-35 days depending on the anticoagulant used.
4. Every healthy individual in the age group of 18-60 years with haemoglobin not less than 12.5 g/dl can donate blood once in three months.
5. Donors with history of Jaundice in past one year, STDs, heart disease, major surgery in past six months, malignant diseases, active tuberculosis and epilepsy should not donate blood.
6. Women in pregnancy and lactation are deferred as blood donors.
7. Donors having history of malaria diagnosed on the basis of malarial parasites in peripheral blood and who have been duly treated or have taken antimalarial drugs may be accepted after three months.
8. In order to ensure the safety of transfused blood, autologous blood transfusion is encouraged particularly for planned surgery.

MYTH

Blood donation causes weakness or disease.

ROLE OF MEDICAL OFFICER

In all surgeries, emergencies, cases of thalessemia, haemophilia and where transfusion of blood or blood products is essential it is the responsibility of the medical officer to ensure safe blood transfusion.

DISPLAY IN YOUR OFFICE

Facilities where blood transfusion available:

S.No.	Name and address of facility	Distance	Time for travel	Mode of transport
1.				
2.				
3.				
4.				

Unit - VII

1. List all the blood banks around your hospital/centre. Determine which of these are licensed and whether they are carrying out HIV testing regularly?
2. Display on a chart the criteria for Donor selection.
3. What are the diseases that can be transmitted by transfusion of blood?
4. A pregnant lady is admitted in the hospital for the delivery. She is advised one unit of Blood. Her haemoglobin level is 8 gm %. Comment.

Unit - VIII

Prevention of HIV Transmission in Health Care Settings

LEARNING OBJECTIVES

At the end of the study of this unit you should be able to acquire the knowledge:

- Of HIV transmission in Health care settings.
- To prevent transmission in Health care settings.
- To deal with accidental transmission of HIV infection in health care settings.

WHAT WE MEAN BY HEALTH CARE SETTING

Health care settings include hospitals, out-patient departments, clinics, nursing homes, dispensaries or any other place in home or community where medical care is provided for curative, preventive, promotive or rehabilitative purposes.

THE PROBLEM OF INFECTION ACQUIRED IN THE HEALTH CARE SETTING

Definition

Infections acquired in the health care setting are the infections which patients acquire from health facilities and these were not being incubated at the time of entry.

Symptoms may appear during or after admission. They also apply to infections among health care workers and visitors who acquired at home while providing home care.

The diagnosis of infections acquired in the health care setting is the same as other infections i.e., it is based on clinical evidence of the disease with laboratory evidence to support in certain circumstances, provided that it can be provided that the causative organism(s) is/are acquired during the period when health care was provided.

RISK OF INFECTIONS ACQUIRED WHILE PROVIDING HEALTH CARE

The overall risk of acquiring infection in the health care setting increases in the presence of the following risk factors:

- Patient factors: extreme ages, malnutrition, immune deficiency, injuries etc.

INFECTION ACQUIRED IN HEALTH CARE SETTINGS

- ***Microbial factors:*** Agents present in high concentration, high level of virulence or the presence of new organisms in the health care environment.

- ***Environmental factors:*** Level of contamination with causative organisms and medical interventions that may facilitate their transmission for example surgery, invasive diagnostic or therapeutic procedures to susceptible persons.

The major concern at the present time is the risk of acquiring HIV in the health care setting. Patients are infected mainly by transfusion of contaminated blood or blood products. Infection through contaminated medical equipment is also possible, although the risk is very low. Health care workers have been infected percutaneously, mainly by sharp injuries i.e. contaminated needles, scalpels and broken glass. Skin and mucosal contact with HIV contaminated fluids has been incriminated in a few cases. The same mechanism of transmission applies to hepatitis B and C (HBV, HCV) infections but the risk is much higher due to the high prevalence of HBV carriers and the infectivity of the virus.

RISK OF TRANSMISSION OF BLOODBORNE VIRUSES TO HEALTH CARE WORKERS

Human immunodeficiency virus (HIV)	
Percutaneous exposure	0.4%
Mucocutaneous exposure	0.05%
Hepatitis B virus (HBV)	
Percutaneous exposure	9-30%
Hepatitis C virus (HCV)	
Percutaneous exposure	3-10%

The setting up of an effective infection control programme requires information on occupational exposure, the prevalence of disease and factors related to it. Such information can be obtained through surveillance by assessing the magnitude of the problem and detecting change over time in the incidence. Prevalence will reflect the magnitude of the problem at a specific time or period, and this can be calculated by counting the number of patients who have acquired infection in the health care setting at the time of survey divided by the total number of patients present at that time. It is relatively simple and more reliable when compared with other methods, but it does not reflect changes in disease incidence unless repeated surveys have been done. Surveillance data are essential for developing and revising infection control policies and procedures.

Infections in the health care setting can occur in the form of outbreaks, when evidence shows that there is a cluster of a particular type of infection in a certain group of people or a significant increase in the incidence of an infection or a site of infection. Attempts to contain an outbreak should begin with an investigation to find the cause of the outbreak. Data on time, place, and persons should be collected and analyzed. Samples should be collected as appropriate for microbiological investigations. Environmental samples are usually not valuable unless there is evidence that they are relevant. Empirical intervention measures have to be implemented initially and specific measures must be carried out when the cause of the outbreak has been identified. Outbreak often arise from faulty techniques, procedures, defective disinfection or sterilization and contamination of pre-sterilized equipment.

PRINCIPLES OF INFECTION CONTROL

The infections acquired in health care setting can be greatly minimized by observing some simple precautions. The broad principles of infection control include the following:

- *Infection control measure:* Each institution should establish an appropriate infection control (IC) policy and programme. A mechanism should be set up for planning, implementing, monitoring and evaluation of the IC programmes. Preventive measure are essential and very cost-effective, but are often overlooked and considered unnecessary by health care workers. Medical institutions are encouraged to set up an IC programme suitable for its resources.

  Hand washing is the most simple and cost-effective measure and must be encouraged. Disinfectants should be prepared and used according to the guidelines. Antimicrobials should be prescribed rationally according to guidelines to reduce bacterial resistance and side effects.

* *Patients:* A patient should not be admitted into a hospital unless it is absolutely necessary and he/she should be discharged as early as possible, to reduce the risk of infection. Patients with low immunity, or those with other predisposing factors to infections should be nursed with special care. Patients with communicable diseases such as cholera should be isolated as appropriate to reduce the risk of transmission to others.

* *Environment:* Health care facilities should be kept clean and void of virulent organisms by proper house keeping. Cleaning of premises and room floors with water and detergent is recommended. Cleaning with a disinfectant is usually not necessary unless there is a spillage with potentially infectious material. Architectural design of a health care facility should permit good ventilation. Extra-measures to decontaminate air in a health care setting is costly and has limited value in infection control. Positive or negative pressure ventilation is indicated in certain areas, but again is expensive and is not superior to practices which ensure a clean and hygienic environment. Proper waste disposal, water treatment, disinfection and sterilization of equipment can reduce the risk of infection among patients, health caretakers and community.

* *Agents:* Microorganisms responsible for infections in health care settings may originate from patients, the environment or health care workers. Those sources of infections are to be identified, and specific measures must be taken appropriately to prevent their spread.

RISK OF HIV TRANSMISSION TO HEALTH CARE WORKERS (HCWs)

The transmission through blood and body fluids, organs, tissues, and contaminated material in health care settings is not much though this likely mode of transmission is responsible for apprehensive behaviour of health care workers towards HIV infected people and AIDS cases.

Transmission of HIV in health care settings can occur due to following ways:

Patient to health care worker transmission

HIV transmission from patient to health care worker can occur when the health care worker is

exposed to the HIV infected blood e.g.

(a) Patenteral exposure, such as needle-stick injury.

(b) Through mucous membrane contact, such as a splash of blood into the health care worker's eye or mouth.

(c) Non-intact skin contact such as splash of blood on to open wounds or broken skin due to dermatitis, acne or cuts or abrasions of skin.

The risk of health care worker of acquiring HIV infection during the course of health care delivery is possible though unlikely. The risk is primarily related to percutaneous (sharp injury) exposure like needle stick injury and has been reported to be less than 0.5%. The HIV cannot enter the body through intact skin but can do so through intact mucous membrane.

The most common way in which health care workers are exposed to HIV is through accidental exposure to sharp objects.

Nearly all cases of HIV transmission to health care workers have occurred through preventable accidents. These are needle-stick injuries, cut from broken blood collection tubes.

Patient-to-Patient transmission

Patient-to-patient spread of HIV infection is usually by an indirect route. This transmission can occur through contaminated needles, syringes and instruments.

Patients can also be infected when they receive contaminated blood or blood products.

Health care worker to patient transmission

Although theoretically this is possible, however, chances of it occurring are almost nil. Thus, HIV infected health care workers are not considered a risk to patients during routine work activities.

Infection control in health care settings consists of

(i) Barrier precautions (Universal precautions)

(ii) Aseptic precautions

(iii) Decontamination

(iv) Disposal of infective waste

Barrier precautions **(Universal Precautions)** in relation to blood, body fluids, tissue and organs.

NOTE

(1) All blood and body fluids to be assumed infectious.

(2) Check the continuity of skin by alcoholic rub.

Hand Washing

Hands and other parts of the body that have been contaminated with blood and body fluids must be washed thoroughly with soap and water. Hands should also be washed immediately after removal of protective gloves and in between handling of patients.

Gloves, Masks, Eye Protector and Gowns

Health care workers should wear gloves for all direct contact with blood and body fluids. When gloves are not available, other methods should be used to prevent direct contact with blood; for example, forceps, towel gauze or, if these are not available, any material such as a plant leaf may be employed to hold a blood stained needle or syringe in rural conditions. If gloves are not disposable, they should be disinfected, washed and sterilized after contact with each patient. When injuries from sharp instruments are possible e.g. when they are being cleaned, extra-heavy duty (rubber) gloves should be used and the instruments should be handled with extreme care.

During procedures in which there may be splashing of blood e.g. during surgery or child birth, the eyes nose and mouth should be protected with a face shield or mask and eye glasses. Suitable plastic sheet should be worn inside gowns.

Mouth-to-mouth resuscitation

Although HIV has been recovered from saliva, the virus is present in very small numbers, less than 1 virus per millilitres (ml). There is no conclusive evidence that saliva can be involved in HIV transmission. Always create barrier by using gauze piece while giving mouth to mouth resuscitation.

CLEANING AND DECONTAMINATING SPILLS OF BLOOD OR OTHER BODY FLUIDS

In case of a blood/body fluid spill do the following

1. Cover the spill with absorbent material, like gauze cotton, newspaper, cloth,
2. Pour the disinfectant fluid over the spill starting peripherally to the centre.
3. Leave the disinfectant fluid for at least ten minutes.
4. Clean the area after wearing gloves.

PRECAUTIONS IN RELATION TO LABORATORY SPECIMENS

1. Always wear gloves when handling and processing specimens of blood and other body fluids.
2. Always collect and transport only in screw cap leak proof containers/bottle
3. Take care to avoid contamination of outer surface of the containers while transporting samples.

4. Under no circumstances mouth pipetting should be permitted (Hb estimation.) Westergren method of measuring ESR should be replaced by wintrobe technique where no mouth pipetting is required.
5. All open wounds on hands and arms of laboratory worker should be covered with a water-proof dressing, preferably, the person should not handle blood or any body fluids.
6. Hands should always be washed with soap and water immediately after exposure to specimens in laboratory procedures.

ASPETIC PRECAUTIONS

1. It is important to restrict injections. Administer parenteral therapy only if alternative effective oral therapy is not possible.
2. Use Sterilized needles/syringe for every injection/immunization
3. Chemical disinfection must not be used for sterilization of needles and syringes
4. Both autoclaved reusable and pre-sterilized disposable needles and syringes are equally safe.

If above precautions are always strictly observed, the risk of transmission of HIV through injections and other skin piercing procedures can be greatly minimized.

STERILIZATION AND DISINFECTION

Sterilization is a process of freeing an article from all living organisms including bacterial, fungal spores and viruses. The most dependable method of sterilization in health care setting is moist heat (steam) under pressure utilizing different types of autoclaves.

A high level of sterilization can be achieved instruments at a temp. of 121°C at 15 lbs/sq inch pressure for 15-20 minutes in specially modified pressure cooker (WHO/UNICEF type). Remember all skin and mucous membrane piercing instruments needles, lancets, scalpels, scissors etc.) and equipment coming in contact with blood and mucous membrane must be sterilized before use.

HIGH LEVEL DISINFECTION

High level of disinfection is a process of destroying all micro organism, however, some spores may survive particularly if initially present in large numbers. This can be achieved by:

Boiling

Completely immersing instruments in boiling water for 10 minutes. This is a simple and reliable method of freeing all article from most of the pathogenic microorganisms in situations where sterilization by autoclaving is not possible.

Chemical Disinfectants

Following chemicals are approved for use as 'hospital disinfectants' in recommended dilution to achieve high level of disinfection. Commonly used disinfectants are:

1. Ethanol - 70% (700 gm/litre)
2. Glutaraldehyde - 2% (Available commercially as Cide:)
3. Household bleach - 1% solution (Available in market as 3.5% ready made solution PolarR. Dilute it with 2.5 volumes of tap water to give 1% solution)
4. Sodium hypochlorite - 1% solution
5. Hydrogen peroxide - 3% solution
6. Lysol - 2.5% solution
7. Savlon® - 5.0%
8. Dettol® - 4.0%

Remember

- Instruments that require sterilization or disinfection should be thoroughly cleaned before being exposed to disinfectants and the manufacturer's instruction for use of disinfectant should followed.
- A solution of Sodium hypochlorite prepared daily is inexpensive, effective and easily available disinfectant. Concentration ranging from 0.1 to 2.0 per cent of available chlorine are effective, depending on the amount contamination.

HANDLING OF SOILED LINEN

All the linen soiled with blood/body fluid should preferably be dipped into 1% household bleach/ sodium hypochlorite for half and hour before washing.

Management of parenteral and mucous membrane exposure of personnel to blood and body fluid:

In case of an accidental exposure with contaminated blood or body fluids the following care should be taken:

1. Allow the accidental wound to bleed and then
2. Promptly wash the exposed surface with running tap water adequately.
3. Clean the area with soap and water.
4. In case of splashing of blood/body fluids into the eyes and silicon contact lenses, if any. Wash eyes gently with water or saline, keeping the eyes open, wash contact lenses also. Clean and disinfect the contact lenses before reuse.

5. If blood gets into the mouth, spit it out and rinse your mouth with water several times.

6. Any of the above incidences should be notified to the physician for risk assessment, treatment, referred for HIV testing and counselling. Establish the HIV status of the person with whose blood/body fluid the exposure was caused.

DISPOSAL OF INFECTED WASTE

In the health care setting all the potentially infected waste should be appropriately disposed off. Safaiwalas should always wear gloves and apron when handling waste.

The infected waste in Health care setting can be disposed off by:

1. Burning-Incineration is a sophisticated method of burning the waste.

2. Deep Burial with bleach or lime.

Waste	**Method of Disposal**
1. Liquid wastes, blood, body fluids, Suction fluids, excretions secretions, placenta	Should be buried in deep pit by covering with blenching powder or lime.
2. Solid wastes, dressing, laboratory and pathology wastes, menstrual pads	Burning Deep Burial

Unit - VIII

1. Enumerate different ways of HIV transmission in health care setting?
2. What are the barriers which should be practised by the health personnel at a Primary Health Centre when handling blood/body fluids?
3. What are the precautions you will practice when handling laboratory specimens?
4. In order to prevent transmission through injections what precautions are advisable to all health personnel?
5. In order of availability list out the disinfectants at your PHC. How will you decontaminate in case of blood-spill?
6. Mouth to mouth resuscitation is required in an Emergency situation. Comment.
7. How will you disinfect reusable gloves/instruments/equipments before and after use?
8. How will you dispose blood contaminated materials like syringes/needles?
9. How will you dispose infective waste in health care setting?

Unit - IX

Information, Education and Communication (IEC) in the Control of HIV/AIDS

LEARNING OBJECTIVES

At the end of studying this unit you should be able to:

- Understand the concept of Information, Education and Communication (IEC)
- Acquire the knowledge of the process of communication, types and problems faced in communication.
- Acquire knowledge of the different IEC strategies formulated for the control of AIDS.

INTRODUCTION

Information (I) means: news, data, facts, knowledge.

Education (E) is the process by which people acquire knowledge, skills, habits, values or attitudes. The word education is also used to describe the results of the educational process.

Communication (C) is sharing information or providing entertainment by speaking, writing or other methods.

The important word in communication is 'sharing'. While communicating, there should be a mutual understanding between the sender and the receiver of a message i.e. it is not merely giving instructions to others.

COMMUNICATION PROCESS

Every communication has three parts:

- the message
- the person who sends the message
- the person who receives the message

Transmission	Reception
A message transmitted is the first half of communication.	It must be received and the receiver must show that the message has been understood.

PROCESS OF COMMUNICATION

Communication can be verbal and non-verbal.

Verbal communication can be one way or two way communication. Non-verbal communication includes body language (gestures, dress, behaviour, eye to eye contact, facial expressions), messages on flip charts, flannel graphs, posters, billboards, flash cards etc.

One-way communication goes from the sender to the receiver. In this sender is never sure that the receiver understands the message and secondly, the receiver resents always being told what to do. Two way communication, means understanding between the two. It means an active role for the receiver who has the responsibility to provide feedback to the sender. If the sender does not get a good feedback, the two way communication will not be effective.

Some guidelines for maintaining two-way communication

1. Communicate clearly: Messages and conversion should be as clear and simple. Important essential information should be communicated.
2. Ask for feedback: Insist on feedback in all communication. Ask for ideas, comments and suggestions.
3. Listen actively: Listen with full concentration. Try to understand the other person's point of view.
4. Understand other's moods: Try to judge the other person's moods and attitude that may be affecting communication.
5. Ask questions: In order to make sure than others understand your message and that you understand their message.

Types of communication

- Interpersonal communication.
- Group communication.
- Mass communication.

Probably the most important type of communication is interpersonal or person to person communication which happens when people make their thoughts and wishes known to one another.

Communication skills are as follows:

- Writing skills
- Speaking and presentation skills
- Listening skills

- Skills pertaining to eliciting information

In communication, listening is as important as speaking. The ability to listen carefully with understanding is a skill. It is often called 'ACTIVE LISTENING'. Active listening requires a person's full attention. It has the effect of encouraging better listening by subordinates as well, thus making communication more effective down the line. For effective communication, it is essential that we practise two-way communication.

PROBLEMS IN COMMUNICATION

1. Inaccurate or incomplete messages:

   Sometimes a message is confusing because the information is wrong or mixed up.

2. Age or social barriers:

   Two-way communication may be difficult when the sender and receiver have a very different status.

3. Filtering:

   People have biases. They see things from different point of view. Sometimes these biases or filters interfere with communications.

4. Leaving someone out of a communications:

   Sometimes a person is left out of a discussion. He misses an important messages and his work suffers.

5. Lack of acceptance:

   Sometimes a person simply refuses to communicate. He hears only what he wants to hear. Perhaps he does not trust the sender or he is in a bad mood. Perhaps he does not agree with the message.

6. Inattention:

   Some people do not pay attention to messages. They do not read instructions carefully. They do not listen carefully.

7. Poor memory:

   A person may communicate a message well but the receiver may forget it.

8. Information overload:

   When a person is given too much information, he may forget some of it. Do not include unnecessary details that may confuse the receiver of the message.

NEED FOR IEC IN HIV/AIDS

Information, Education and Communication is a pre-planned concerted, educational endeavour with specific objectives, focused towards specific programme goals in order to reach specific audience either in individual, group or mass setting through skilful use of proper methods and media. This module very clearly states that the leading modes of HIV transmission are related to sex behaviour and practices. Besides, no curative or preventive treatment is available at present. Under these circumstances, the success of the National AIDS Control Programme lies in carefully understanding the strategies laid out in the IEC component of the programme, then developing and implementing districtwise action plan.

Recent studies focusing on Knowledge, Attitude, Beliefs, Practices of people in different parts of the country have revealed that:

1. Most individuals do not have accurate and complete information on HIV infection/AIDS.
2. The direct link between STD and AIDS is not clear to most people.
3. STDs are not perceived as serious conditions since they are curable.
4. There is a belief that HIV transmission and AIDS is found only in a limited section of people such as foreigners, homosexuals, commercial sex workers and drug users.
5. There is an attitude among many that 'AIDS can't happen to me' and AIDS is not a problem of major concern for India.

STRATEGIES AND ACTIVITIES OF IEC COMPONENT OF THE PROGRAMME

On the basis of the above findings, the strategies and activities of IEC were formulated with the following objectives:

i. To raise awareness, knowledge and understanding among the general population about AIDS and HIV infection, transmission and the methods of prevention.

ii. To promote safe practices such as condom use, use of sterilised needles and syringes, use of safe blood through the promotion of voluntary blood donation.

iii. To mobilise all segments of the society to integrate AIDS messages and programming into existing activities.

iv. To ensure that all relevant health workers are trained in AIDS communication and coping strategies and thereby strengthen technical and managerial capabilities.

It is well recognised by the authorities that the IEC activities in isolation are not effective. Therefore the IEC component has been integrated with the other components of the AIDS control programme. The educational messages and information are backed by condom programming, STD services and blood safety programme carried out by well trained health personnel.

One of the strategies included in the IEC efforts is 'Advocacy' whereby efforts are made to convince the policy makers and opinion leaders regarding the importance of the problem of AIDS

as well as the need for securing the human rights of those affected. This is proposed to be achieved through a series of orientation meetings with all concerned.

YOUTH

The Department of Youth Affairs and Sports, Ministry of Human Resource Development has taken up a number of activities to protect youth and to involve them actively in the AIDS prevention and control activities. AIDS prevention and control activities among youth is being implemented through a programme named Universities Talk AIDS (U.T.A.) by NSS (National Service Scheme) to reach all major universities and plus-2 level schools. A comprehensive training module for youth leaders in NSS has been developed along with a series of IEC materials.

In order to reach the message in the rural areas, the Department of Youth Affairs and Sports has organised multimedia workshop using rural art forms. Plans are underway to tap large networks of youth like NCC, NYK, YMCA, YWCA, Bharat Scouts and Guides etc.

As Medical Officer providing health services in the primary health care settings, you can contribute to these activities in a big way. You may identify such youth networks in your area of jurisdiction and actively participate in the AIDS awareness programmes through coordinating and strengthening their activities.

INDUSTRY

The industry are also encouraged to initiate activities informing their workers and their families about AIDS and is control measures in their place of work. These activities are supported by WHO and ILO.

TARGETED INTERVENTIONS

People with high risk behaviour practices require targeted, integrated approaches. These include special IEC approaches, and provision of support services such as condoms and STD services. Some identified targeted population groups are injective drug users, migrant workers, industrial workers, military personnel, the commercial sex industry, street children, truck drivers, and slum dwellers. Special IEC efforts for some such target groups have been initiated.

INVOLVEMENT OF NGOS

The NGOs have access to the 'difficult to reach' population and many groups practising high risk behaviour. They can play a major role in AIDS prevention and control. They will provide the essential link to enable the community based care to be effective. An operational guidelines for involving the NGOs in community based care been formed already.

TRAINING

All the health care workers are to be trained on how to protect themselves and on how to provide compassionate treatment to those afflicted with HIV/AIDS. They also need to be trained in how to educate and motivate others to adopt healthy safe behaviour. Preparatory efforts for training have already been initiated for different categories of health personnel.

Unit - IX

1. What do you understand by IEC?
2. What are problems in communication? How can you overcome these problems?
3. Based on IEC strategy, plan for HIV/AIDS control in your area for different groups in population.

Unit - X

Condom for Prevention of HIV Transmission

LEARNING OBJECTIVES

At the end of this unit, you should be able to:

- Know the advantages of condom usage.
- Explain the correct use of condom.

The Family Welfare Programme has been promoting the use of condom 'NIRODH' as a measure for birth spacing. It is well known fact today that for those who have sex outside marriage or mutually unfaithful relationships like visiting commercial sex workers, multiple sex partners etc., strategies that reduce the risk of transmission should be adopted. The use of new latex condom with each act of sexual intercourse can reduce the chance of HIV infection to a great extent.

If properly used, condoms provide an effective mechanical barrier against sexually transmitted agents, including HIV, providing a barrier that reduces the risk of infections acquired through penile exposure to infectious secretion or lesions of the cervix, vulva and anus. The partner gets protected by condoms by preventing:

- deposition of semen
- urethral discharge
- exposure to lesions on the penis

The failure of condoms to provide effective protection is usually the result of either inadequate or improper use which usually occurs due to conditions like:

- Use of condoms under the influence of alcohol
- The condoms are not being stored properly
- They breach during intercourse

WHAT KIND OF CONDOMS TO USE

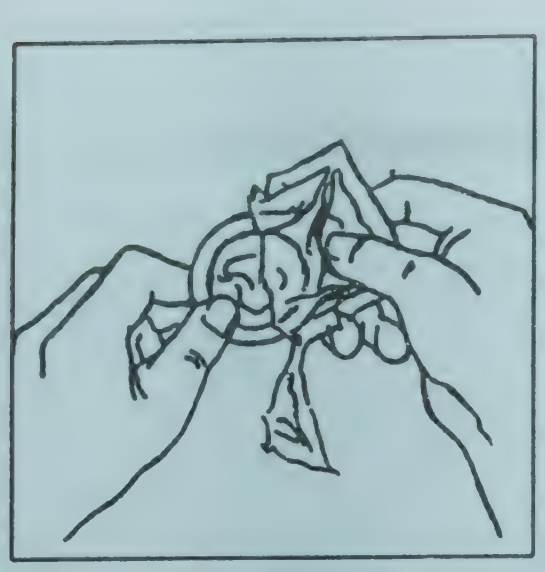
(i) The best condoms to use are made of latex, have reservoir (nipple) ends and are lubricated.

(ii) Always use a fresh, new latex condom for each act of sexual intercourse.

(iii) Do not use condoms that are small, sticky or discoloured (usually due to its expiry) because these condoms may not prevent infection.

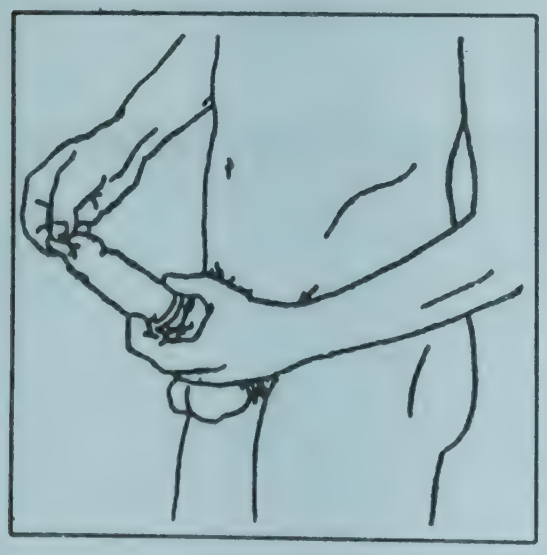
(iv) If extra lubrication is needed, only water based lubricants should be used. Petroleum or oil based lubricants, such as petroleum jelly (Vaseline), lotions and cooking oils should not be used because they weaken the latex.

(v) If condom breaks during sexual intercourse, it should be immediately replaced with another one.



Carefully open the package so the condom does not tear. Do not unroll condom before putting in on.

If not circumcised, pull foreskin back. Squeeze tip of condom and put in on end of hard penis.



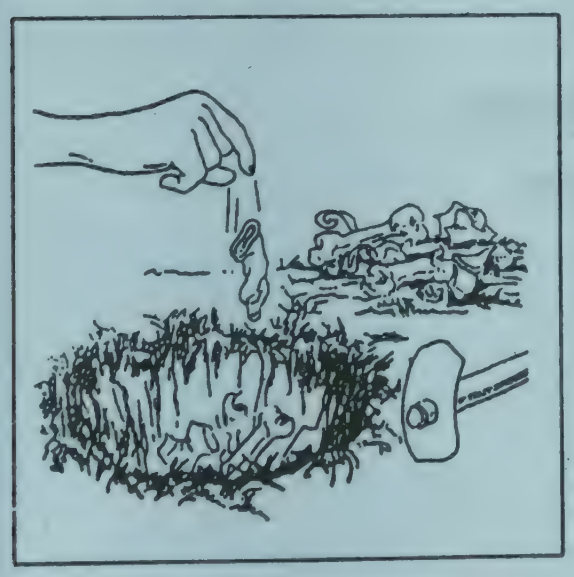
Continue squeezing tip while unrolling condom until it cover all of penis.

Always put on a condom before entering partner.

After ejaculating (coming), hold rim of condom and pull penis out before penis gets soft.

Slide condom off without spilling liquid (semen) inside.

Tie and wrap the condom (in paper, if available) then throw in dust bin. Wash hands.



Burn or bury the condom with other trash. Wash hands.

HOW TO PUT ON A CONDOM

(i) Put the condom on or after the penis becomes erect.

(ii) Put the condom on before any genital contact.

(iii) Hold the tip of the condom between a finger and thumb of one hand leaving space at the tip to collect semen, squeeze it to prevent air from being trapped in the tip.

(iv) With the other hand, put the condom on the end of the penis and unroll the condom down the length of the penis by pushing down the round rim of the condom. If this is difficult, the condom is 'inside out'. Turn the condom the other way round, take hold of the other side of the tip and unroll it.

(v) When the rim of the condom is at the base of the penis (near the public hair) penetration can begin.

HOW TO TAKE OFF A CONDOM

(i) Soon after ejaculation, withdraw the penis, while it is still hard, holding the bottom end of the condom to prevent it from slipping of the penis.

(ii) Do not let the penis go soft because the condom may slip off and spill semen in or near the vagina.

(iii) Do not allow semen to spill on hands or other parts of body, wash hand and other body parts if contact with semen occurs.

(iv) Dispose them off safely by flushing them down a toilet, throwing them down a pit latrine, burying them or burning them.

(v) Wash hands to remove vaginal secretions/semen which can also be infectious.

(vi) It is also important to remember that condoms can be damaged by:

- heat
- moisture
- sunlight

So remember that:

(a) Condom should be kept in a cool dry place out of direct sunlight.

(b) Consistent use of condom greatly reduces risk of transmission.

Unit - X

1. Describe the importance of barrier contraceptives in prevention of HIV transmission.
2. What kind of condom will you advise for use?
3. What precautions should be taken while putting on and taking off condoms?
4. How will you dispose off a used condom?

Unit - XI

Counselling in HIV Infection

LEARNING OBJECTIVES

At the end of studying this unit you should be able to:

1. Acquire the knowledge of counselling individuals for HIV/AIDS.
2. Acquire the skills for counselling an individual regarding:
   (i) safe sex
   (ii) intravenous drug abuse
   (iii) pre-test and post-test counselling results
   (iv) living with HIV infection/AIDS.

INTRODUCTION

Counselling is face to face communication by which you can help the person make decisions and act on them. It aims at preventing transmission of HIV infection and providing psychological support to those already affected.

Counselling is a helping process aimed at problem-solving. It helps people to understand themselves better in terms of their own needs, strength limitations, and the resources they can avail of. It brings about change through a supportive relationship, aiming to make the client independent through the interpersonal contact along with opportunity to ask questions and to meet frequently and help greatly.

TIPS FOR GOOD COUNSELLING

1. Greet your client.
2. Make him/her comfortable.
3. Create the confidence of the client in you and assure confidentiality.
4. Listen carefully to his/her problems.
5. Do not interrupt while he/she is talking.
6. Try to elicit more information regarding his/her problem.
7. Counsel over a number of sessions and be empathetic towards the client.
8. Provide information on the issue for which your client has come.

9. Help him/her to reach a decision.

10. Time to time reassurance and follow up regarding health condition.

11. Encourage client to decide regarding communication of his problem to the family members/ spouse. It should be done in the presence of the counsellor.

The medical officers undergoing training should be able to improve through a series of role plays the following qualities viz.

Willingness to listen, empathy and understanding of client's dignity, good communication skills, non-judgemental attitude i.e. should not bring his/her own values and impose on the client and maintain confidentiality, about their life, boost their self-confidence, improve family/community relationships, and support the families of infected people by providing encouragement and care for those with HIV infection.

FUNCTIONS OF COUNSELLING

Prevention

Counselling is concerned with preventing infection with HIV and its transmission to other people and living with HIV/AIDS. The main steps of preventive counselling are:

* determine whether individual/group has high risk behaviour patterns.
* help people to understand and acknowledge their high risk behaviour patterns.
* define with them how their life style and self image are linked to their behaviour.
* help individual define their potential for changing behaviour.
* work with individuals to introduce and sustain the modified behaviour.

Health Promotion

This involves counselling those individuals having high risk behaviour patterns but not aware of the magnitude and the nature of risk involved to their life. It aims at creating this change focusing on behaviours that present a risk of HIV infection and reviewing ways of managing individual change.

Specific Protection

Those infected with HIV should be given instructions as to ways by which they can prevent the spread of infection to others. An attitude of understanding should be adopted as the fact that he has tested positive is traumatic enough to accept. Since behaviour change is going to be difficult he should be asked to take certain precautions:

* do not donate blood

- use condom while have sexual intercourse.
- do not share needles and syringes.

Psychological Support

People diagnosed with HIV infection and HIV related illness and those close to them are confronted by a multitude of problems and often need emotional support and/or practical support. People have anxieties regarding hospitalization, and depression because of stigma attached to their condition. Counselling should help those infected by HIV to live full and productive lives by enabling them to 'take charge' of their lives and help in decision making, thus enabling people to remain active in their work and in their education. Families and friends can help to reduce their dependence on health and social services and reduce their psycho-social problems.

Requirements of counselling

Approaches to counselling will differ from individuals and groups depending upon the characteristics of the people being counselled and their social and family networks. Certain points which remain constant irrespective of the situation are:

The client cannot be rushed by the news that he is HIV positive. Sufficient time should be taken to establish rapport with the client so as to understand his mental framework and basic level from where the counselling should be carried forward. This basic level will determine the number of sessions required by the person to make decision about his life style.

Acceptance

The people infected by HIV should not be shunned on basis of the behavioural patterns adopted by them. They should be treated with respect whatsoever their background or behaviour.

Accessibility

People found to be HIV positive are bound to develop anxieties and fear which will be always raising some doubts in their minds. Therefore, counselling services should be available easily where the individual can approach at any time and get clarifications.

Consistency and Accuracy

Any information provided through counselling should be consistent, therefore, the counsellor must equip himself with all the latest knowledge and management of HIV infection and disease so as to be able to clarify doubts/uncertainties arising in the minds of the client. He should not pretend to know or acknowledge a thing when in doubt but try to clarify it.

Confidentiality

Being diagnosed HIV positive creates uncertainties in the mind of the clients. The counsellor should be able to gain the trust of the client and convince him that all information provided by him will be kept confidential.

As HIV infection is progressive, it is necessary that counselling should be undertaken regularly to understand what the client is going through due to the various changes occurring within him and those around him. The counsellor should also provide to the client necessary information regarding where he will be able to get medical support, community resources and what changes he can make in his life styles to cope with emerging needs.

Counselling Before HIV Testing

Counselling before the test should provide the individuals being tested with information on technical aspects of screening and possible personal, medical, social, psychological and legal implications of being tested +ve or -ve. The information should be simple and up-to-date. Testing should be organised in a way that minimizes the possibility of disclosure.

Issues in Pre-Test Counselling

Pre-test counselling consists of two parts:

1. Personal history and assessment of risk
   * Sexual behaviour - multipartner, prostitutes, unprotected sex, homosexuality, bisexuality.
   * drug users.
   * blood transfusion
   * organ transplant
2. Assessment of factors and knowledge
   * Why test is being requested?
   * What behaviours/symptoms are of concern to the client/
   * What the client knows about test and its uses?
   * What will the client do if test +ve or -ve?
   * Beliefs regarding HIV transmission.
   * What role will family play?

Post-Test

If results are negative: The client may feel relief, however, should be exercised as following

exposure to HIV there is a 'widow period' during which negative result cannot be considered reliable. Further, a negative test should not give a false sense of security to a person indulging in unsafe sex. Three months must have elapsed from possible exposure before a negative test can be considered to mean that there is no infection. A negative test result carries greatest certainty if six months have lapsed after last exposure. HIV infection can be prevented by avoiding high risk behaviour, safer sex, avoiding sharing needles. In general, development of safer sex behaviour has to be to advocated to the client.

If result are positive: People diagnosed as having HIV infection should be told about their results privately and in confidence. Single test giving positive result does not necessarily mean HIV infection. To establish HIV infection, three tests for Antibodies based on different Antigens/ methods are to test positive. Discussion should be allowed with the clients to absorb the news. After a period of preliminary adjustment the client should be given clear and factual explanation of what the news means. This does not mean speculating about prognosis of estimate about the time left to live but for providing support; and encouraging hope for achievable solutions to personal and practical problems that may result. The client must be informed where resources are available and possible treatment for some symptoms to HIV infection and efficacy of anti-viral treatment.

Psychological issues

The uncertainty involved when the individual comes to know he has tested positive are varied. Clarifications are to be given regarding the fears which arise related to illness, death, job, length of life, etc. Besides these the individual feels at a loss due to stigma attached by society and the speculation in the minds of people regarding the behaviour of those infected with the virus.

There is generalised anxiety regarding all aspects of life, anger, depression and denial of the fact that he has tested positive can even lead to suicidal thinking in the individual.

These numerous feelings can only be changed through counselling and giving correct information about the infection and disease and building the self esteem and the positive thinking ability of the individual.

Besides the individual who has tested positive those dealing with them. i.e., the health workers and family face the share of fears and uncertainties regarding their getting the infection. All those involved with those who have tested positive need to be given proper and full information so that they can provide the support which the individual requires to be able to face their problem.

Some special issue

- Pregnancy: Those females of child-bearing age found to be HIV +ve should be told to avoid pregnancy and the risk of vertical transmission from mother to child.
  - If pregnant: There is a one-in-three chance of having an infected child. Counselling depends on the personal, religious, cultural factors regarding termination of pregnancy.

- Both the partners need to be counselled.

- Infants: should be kept under medical observation and treated with care and affection. Parents and siblings need to be counselled. Though the risk of acquiring infection from infants' body fluids is minimal, nevertheless the people with cuts should avoid contact with fluids. Hygienic practices would be emphasized upon.

Breast feeding

This may result in transmission of HIV from mother to child. In developing countries, withholding breast feeding may deprive the newborn of the protective immunity transferred from mother to newborn. Therefore, a counselling is required to have a balance between the two, the possibility of acquiring HIV infection and the lack of antibodies in the newborn if not breast fed.

Unit - XI

Situation 1:

Jaswant Singh is a 26 years old truck-driver. He has repeated unprotected sexual intercourse with commercial sex workers. He had consulted you. On your advice, he had undergone HIV antibody test at the District Hospital which shows that he is HIV positive. He says his wife is now 3 months pregnant and is worried whether his unborn child may be infected. How would you handle the situation?

Situation 2:

Rajni is 16 years old. She had gone to stay with sister for last 3 months during her delivery, and her sister's husband had forcible sex with her several times. She has heard that her sister's husband is in the habit of visiting commercial sex workers in the town. She has heard of AIDS from T.V. She is now worried whether she is suffering form this disease, and whether she can have a normal life after marriage?

Situation 3:

Kishan is 12 years and in class VI. Last year he was hit by a lorry resulting in serious injuries. He was transfused 2 units of blood purchased from a private bank. Blood sample tested from this bank has been found positive for HIV recently.

Advised by his uncle Kishan's father tales him to a dresser in District Hospital for HIV testing. His blood is found to be HIV positive. This Kishan tells his friend Chandan, his classmate. Chandan spread this in other classmates and teachers. Kishan finds schoolmates and teachers hostile towards him. He tells his father Ram. Ram alongwith school Headmaster comes to you for your counsel. What will you do?

Situation 4:

Mahipal a male Health Worker, has been stuck with the needle while giving immunization to a child with HIV infection. He is afraid that he has contracted the infection.

Situation 5:

Anju, 25 years old, whose husband is a rickshaw puller, is HIV infected. She has recently delivered a baby. Though she wants to breast-feed the baby, she is afraid that the baby may get the infection. She comes to you for counselling.

Situation 6:

Narang 30 years old, working in the dhaba has sex with lorry drivers who comes to the dhaba

for the money they give. She has heard about AIDS. She comes to you asking you to fit her with I.D.U. as she feels this will protect her from AIDS as well pregnancy.

Situation 7:

Ram Prakash an IVDU comes to you. He wants to be tested for HIV. How will you manage?

Unit - XII

National AIDS Control Program

LEARNING OBJECTIVES

At the end of studying this unit, the you should able to.

1. Describe the objective, organisational set up and components of the National AIDS Control Programme.
2. Identify specific role as a health system manager, in the promotion of the programme in primary health care setting
3. Describe the facilities and services provided by the government and the sources from where their services can be availed to provide care of HIV infected persons and AIDS cases.

INTRODUCTION

The recognition of emergence of infection with Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome as a public health problem in India and the indication given by results of surveillance regarding the possibility of HIV epidemic in this country has prompted the government to formulate and implement the National AIDS Control Programme. Since every health functionary in the country has to contribute to support this programme, the Medical Officer, as the health system manager at the primary health care level, has major role to play towards meeting the goals of the programme. In this unit, a brief account of the National AIDS Control programme, highlighting its genes, objectives, organisational set up, specific programme components etc. in given.

GENESIS OF THE PROGRAMME

The first evidence of HIV infection in India was reported in the commercial sex workers of Chennai. The first case of AIDS was reported in the country in the same year. The Government of India without leaving any room for complacency and with the threat of an impending epidemic looming over the country, a National AIDS Control Programme was launched in 1987. The objective of the programme was mainly:

1) Surveillance - to know the magnitude of the problem
2) Blood safety - as blood being the major source of the transmission.
3) Information, Education and Communication strictly was one of the major part to impart knowledge to the general public about the disease which has assumed a great public health importance.

In 1989-1990 the Government of India in consultation with World Health Organization (WHO)

prepared a medium term plan for prevention and control of AIDS for the period of 1990-92. The major activities undertaken were focused on the way of metropolitan cities and states of Maharashtra, Tamil Nadu, West Bengal, Manipur, where there had been rapid increase in HIV infection. These activities included surveillance, establishment of safe blood supply system and counselling of high risk groups.

NATIONAL AIDS CONTROL PROGRAMME

The National AIDS Control programme was launched in India in 1987. In 1992, Government of India negotiated an IDA Credit of US$ 84 million to support the implementation of a 5 year HIV/ AIDS Control project from September 1992 to September 1997. The project was later extended upto 31st March, 1999. The objectives of the project were:

1. To slow the spread of HIV
2. To decrease morbidity and mortality associated with HIV infection
3. To minimise socio-economic impact resulting from HIV infection

A National AIDS Control organisation was set up with a Project Director in the rank of Additional Secretary to Government of India and supporting technical and administrative staff. A National AIDS Control Board was set up under the chairmanship of Secretary (Health) to review policies, expedite sanctions, approve purchase of equipment and award contracts to private agencies. A National AIDS Committee was constituted under the Chairmanship of Minister of Health & Family welfare for effective intersectoral coordination in implementing the program. State AIDS Cells were established in the 25 states and 7 union territories with technical and administrative powers for implementing the scheme.

COMPONENTS:

ACHIEVEMENTS OF THE NATIONAL AIDS CONTROL PROGRAM IN INDIA

- A scientific case reporting system has been set up with 65 serc-surveillance centres spread throughout the country. A sentinel surveillance system was introduced to monitor the trend of the infection with 55 sentinel sites initially which were increased to 180 in 1998.
- Control of sexually transmitted diseases by strengthening and establishing 504 STD clinics and 5 regional STD Teaching, Training & Research.
- Establishment of National and State Blood transfusion Councils to oversee the progress made in blood safety program. 815 blood banks at various levels have been modernised and 40 blood component separation units established. Complete ban on professional blood donations w.e.f. 1st January 1998 and mandatory screening of blood units for HIV, Hepatitis B, Syphilis and Malaria.
- Scaling up of awareness and social mobilisation by using mass media, advocacy and involving NGOs/CBOs. Sensitising university Students through University Talk AIDS program
- Successful implementation of targeted intervention projects for high risk population like commercial sex workers, truck drivers and injecting drug users etc.

NATIONAL AIDS CONTROL PROGRAM PHASE II (NACP-II)

The 2nd National AIDS Control Program (AIDS II project) will shift focus from raising awareness to changing behaviour through interventions, particularly for groups at high risk of contracting HIV. The project would support decentralisation of service delivery to the states and municipalities and a new facilitating role for NACO.. The project will help to protect human rights by encouraging voluntary counselling and testing and discourage mandatory testing. The project would support structured and evidence based annual reviews and ongoing operational research. The project would encourage management reforms to bring about 'ownership' of the program among the states, municipal corporations and other implementing agencies.

NACP II has two key objectives namely, i) to reduce the spread of HIV infection in India and ii) strengthen India's capacity to respond to HIV/AIDS on a long term basis.

COMPONENTS:

The projects has two components and five sub-components:

(a) Deliver cost-effective interventions against HIV/AIDS:

(i) Priority targeted interventions for groups at high risk (commercial sex workers, injecting drug users, migrant workers, men having sex with men and STD clinic attendees). These groups would be identified and provided with counselling, condoms, treatment of STDs, and Client IEC and treatment programs.

(ii) Preventive interventions for the general community: the project would provide locally appropriate IEC and awareness campaigns, voluntary testing and counselling and a strengthened infrastructure for blood safety and hospital and occupational precaution programmes.

(iii) Low cost AIDS care:

The project would improve the quality and cost effectiveness of interventions offered by existing providers for treating opportunistic infections (OI), seed grants for NGO and consultant services research and other studies etc.

(b) Strengthen Capacity:

(iv) Institutional strengthening –

The project would help to improve the impart and technical, managerial and financial susceptibility of national, state and municipal programmes. It would do so by: (i) enhancing planning, management and implementation capacity, (ii) strengthening the leadership capacity of NACO; (iii) increasing the quantity, quality and timeliness of surveillance systems for HIV, STDs and other behaviour pattern; (iv) building capacity for ongoing monitoring and evaluation; (v) conducting training in areas of management and provision of interventions and (vi) supporting high quality, peer-reviewed and competitive operational research as well as research development.

(v) Intersectoral Collaboration:

The project would help catalyze the public, private and voluntary sectors to strengthen their own HIV/AIDS control programmes.

BEHAVIOUR CHANGE THOUGH I.E.C.

Strategic plan gives prime importance to IEC component. Consistent messages from all channels, mass media, traditional media, health care workers and interpersonal channels have to work in tandem to achieve the objective of change in behaviour

For combating the spread of HIV, I.E.C. and Social mobilization strategies include Advocacy, Intersectoral Collaboration, Mass Media, Involvement of N.G.O.'s. Training and Research. Initially targeted ministries are Family Welfare, Women and Child Development, Labour, Welfare, Railways, Tourism, and Information and Broadcasting. Universities Talk AIDS programme implemented by NSS under Department of youth affairs is geared to reach all Universities and Senior Secondary Schools. Activities to utilise all forms of mass media are planned. Messages and material, are tailored to regional and state conditions.

Detailed studies on risk factors in sexual behaviour, community care and women and AIDS are proposed to be undertaken.

CONTROL OF SEXUALLY TRANSMITTED DISEASES

The association between AIDS and STD is well recognised and the Government of India has taken steps to strengthen the STD Control programme. In addition, special efforts to train health care workers in STD control i.e. case detection and their management, health education and counselling are being organised. Baseline surveys to assess the magnitude of STD are being undertaken in different parts of the country.

CONDOM PROGRAMMING

The commonest mode of transmission of HIV infection in India is through heterosexual intercourse. The proper use of an intact latex rubber condom of good quality during sexual intercourse is the best way to avoid infection through this mode. GOI supports the promotion of condom use through condom programming.

BLOOD SAFETY

The blood safety programme aims at developing and strengthening the national blood transfusion system and ensuring adequate supply of safe blood to the blood banks. At present there are 1352 blood banks (including 815 in the public sector) operating throughout the country, the remainder being voluntary organisations. Blood banks depend mainly on replacement and voluntary donors.

In order to ensure safe blood to the recipients, 180 HIV zonal blood testing centres have been established in 112 cities. They have established linkages with the blood banks. These zonal

centres receive samples from the blood banks attached to them and they provide them with the results of the HIV test. According to the present policy, the blood is discarded if it is HIV positive in the first ELISA test. A repeat test is not done.

Rational of use blood and voluntary blood donation are being promoted. The medical officers should ensure that whenever blood products are being transfused, he should check it to see that it has been tested and is free of HIV infection

REDUCTION OF IMPACT OF AIDS/HIV

Counselling

In order to prevent transmission of HIV infection and reduce the psychological and social impact of HIV illness on the affected individuals and their families, counselling services in India are selective, providing the basic elements of a sustainable and appropriate infrastructure that will provide a sound basis for future developments. Training efforts to develop expert AIDS counsellors as well as to incorporate training on counselling in other regular training programmes are being initiated.

Unit - XII

1. Enumerate important objectives to be achieved on medium and long term basis.
2. What important components of the strategic plan to meet these objectives?
3. As a Medical officer, how will you implement, National AIDS control programme in your area?

Post Exposure Prophylaxis Guidelines

INTRODUCTION

Health care workers (HCW) are normally at a very low risk of acquiring HIV infection during management of the infected patient. However, inspite of a low statistical risk of acquisition of HIV, the absence of a vaccine or effective-curative treatment, makes the health care worker apprehensive. So, it is very necessary to have a comprehensive programme in place to deal with anticipated accidental exposure.

Most exposures do not result in infection. The risk of infection varies with type of exposure and other factors such as:

- The amount of blood involved in the exposure
- The amount of virus in patient's blood at the time of exposure
- Whether post exposure prophylaxis (PEP) was taken within the recommended time.

Prevention is the mainstay of strategy to avoid occupational exposure to blood/body fluids. All the biosafety precautions emphasized in chapter 4 must be practised at all times when handling patients, blood and body fluids while providing medical services.

DEFINITION OF AN OCCUPATIONAL EXPOSURE

An occupational exposure that may place a worker at risk of HIV infection is a percutaneous injury, contact of mucous membrane or contact of skin (especially when the skin is chapped, abraded or afflicted with dermatitis or the contact is prolonged or involving an extensive area) with blood, tissue or other body fluids to which universal precautions apply.

STEPS TO BE TAKEN ON EXPOSURE TO HIV INFECTED BLOOD/BODY FLUIDS AND CONTAMINATED SHARPS ETC.

Immediately following an exposure:

- Needlesticks and cuts should be washed with soap and water;
- Splashes to the nose, mouth or skin, should be flushed with water;
- Eyes should be irrigated with clean water; saline, or sterile irritants;
- Pricked finger should not be put into mouth, reflexively.

No scientific evidence exists as to the fact that the use of antiseptics for wound care or squeezing the wound will reduce the risk of transmission of HIV. However, this must always be done. The use of a caustic agent such as bleach is not recommended (Annexure 17).

Report the exposure to the appropriate authority and condition must be treated as an emergency. Prompt reporting is essential because in some cases, HIV post-exposure prophylaxis (PEP) may

be recommended and it should be started as soon as possible, preferably within a few hours.

Based on animal models, the success of PEP therapy is reported to be maximal when started within a matter of hours after the exposure. Although, any cutoff time is arbitrary initiating treatment more than 72 hours after the exposure is not recommended. Although perhaps not as effective as prophylaxis, late PEP (after 72 hours) may still be useful as early treatment of HIV infection, in case infection has occurred.

TYPES OF OCCUPATIONAL EXPOSURES TO HIV FOR WHICH PEP IS RECOMMENDED

Most occupational exposures do not lead to HIV infection. The chance of possible serious side effects (toxicity) of the drugs used to prevent infection may be much greater than the chance of HIV infection from some kinds of exposures. Both risk of infection and possible side effects of drugs should be carefully considered when deciding whether to take post-exposure prophylaxis. Exposures with a lower infection risk may not be worth the risk of the side effects associated with these drugs. The decision to start PEP is made on the basis of degree of exposure to HIV and HIV status of the source from whom exposure/infection has occurred: (**Fig. 17.1, 17.2, 17.3**).

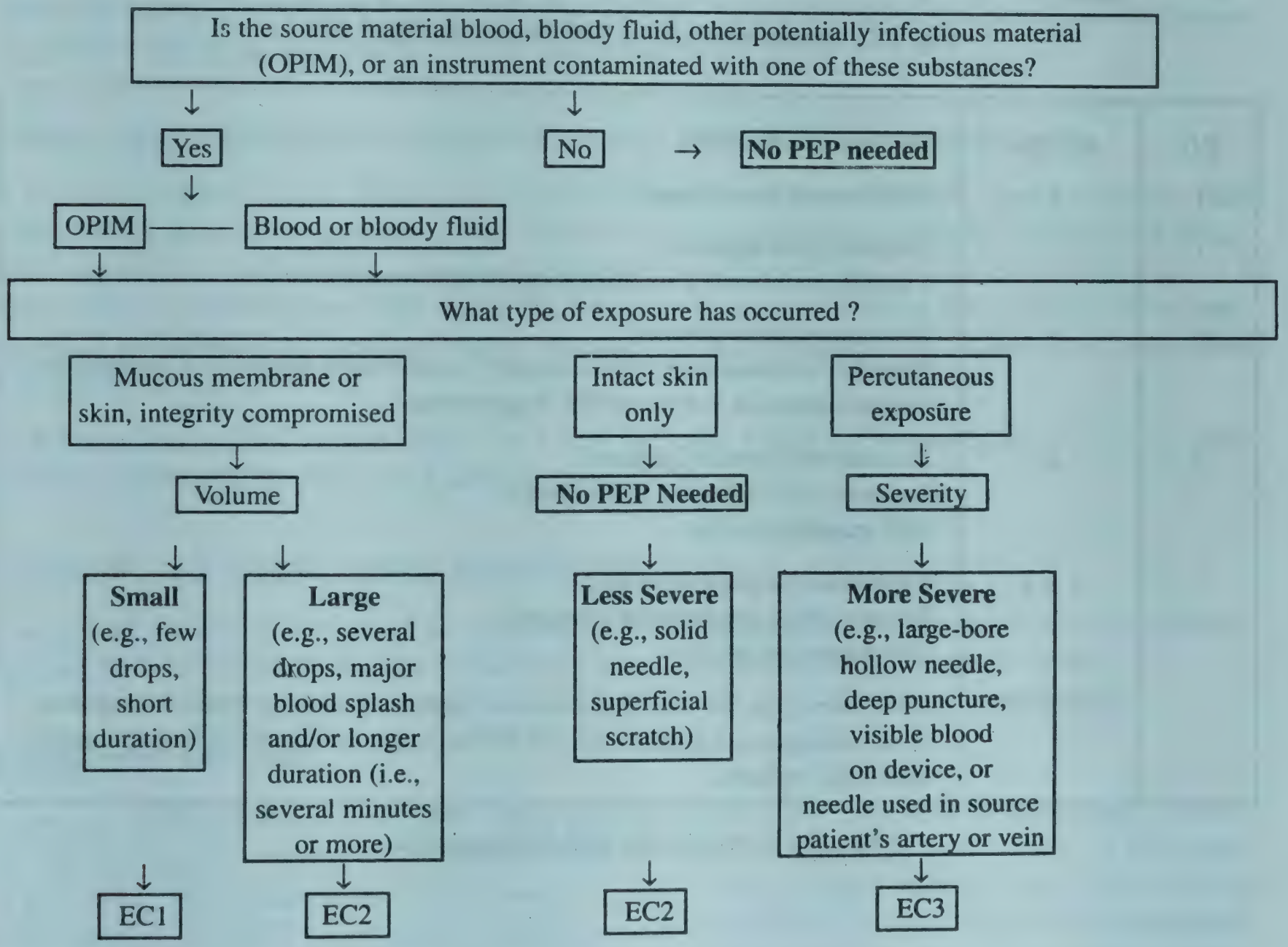

Is the source material blood, bloody fluid, other potentially infectious material (OPIM), or an instrument contaminated with one of these substances?
Yes
No
No PEP needed
OPIM
Blood or bloody fluid
What type of exposure has occurred ?
Mucous membrane or skin, integrity compromised
Intact skin only
Percutaneous exposure
Volume
No PEP Needed
Severity
Small (e.g., few drops, short duration)
Large (e.g., several drops, major blood splash and/or longer duration (i.e., several minutes or more)
Less Severe (e.g., solid needle, superficial scratch)
More Severe (e.g., large-bore hollow needle, deep puncture, visible blood on device, or needle used in source patient's artery or vein
EC1
EC2
EC2
EC3

Fig. 17.1 Determination of the Exposure Code (EC)

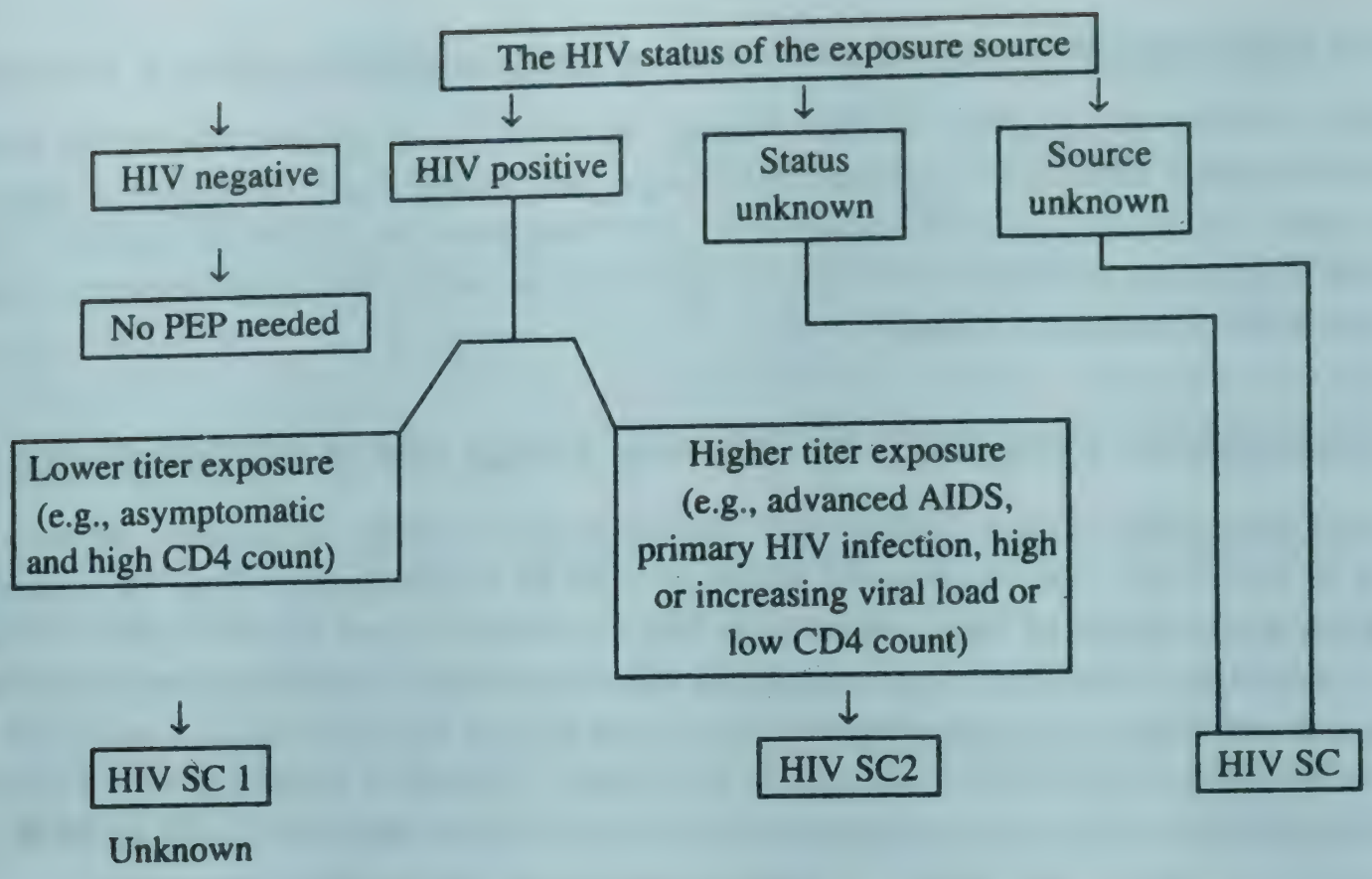

The HIV status of the exposure source
HIV negative
HIV positive
Status unknown
Source unknown
No PEP needed
Lower titer exposure (e.g., asymptomatic and high CD4 count)
Higher titer exposure (e.g., advanced AIDS, primary HIV infection, high or increasing viral load or low CD4 count)
HIV SC 1
HIV SC2
HIV SC
Unknown

Fig. 17.2 Determination of the HIV Status Code (HIV SC)

EC	HIV SC	PEP recommendation
1	1	PEP may not be warranted
1	2	Consider basic regimen. Exposure type poses a negligible risk for HIV transmission.
2	1	Recommend basic regimen Most HIV exposures are in this category ; no increased risk for HIV transmission has been observed but use of PEP is appropriate.
2	2	Recommend expanded regimen. Exposure type represents an increased HIV transmission risk.
3	1 or 2	Recommend expanded regimen. Exposure type represents an increased HIV transmission risk.
	UNKNOWN	If the source, (in the case of an unknown source), the setting where the exposure occurred suggests a possible risk for HIV exposure and the EC is 2 or 3, consider PEP basic regimen.

Fig. 17.3 Determine the PEP recommendation

PRE- AND POST TEST COUNSELLING AND TESTING

The person should be provided with pre test counselling and AZT be started as discussed above. Before starting AZT, 3-5 ml of person's reference blood sample is taken and tested for anti-HIV antibodies immediately after the exposure. In case the sample tests positive as per the strategy of HIV testing the individual is referred to the clinician for management, as a case of HIV infection. In case the sample tests non reactive, a 2nd sample is collected at 6 weeks and 3rd at 12 weeks after the exposure and tested for HIV-antibodies. The facilities for RT-PCR are available presently at Christian Medical College, Vellore and NARI, Pune and AIIMS, New Delhi and this can give us results even at 2nd or 4th weeks after exposure. Post test counselling is done in all cases.

During the follow-up period, especially the first 6-12 weeks when most infected persons are expected to show signs of infection, the recommendations for preventing transmission of HIV are to be followed by the HCW. These include refraining from blood, semen, organ donation and abstaining from sexual intercourse. In case sexual intercourse is undertaken a latex condom must be used correctly and consistently. This reduces the risk of HIV transmission. In addition, lactating women should not breast-feed their infants during the follow-up period after exposure to prevent exposing their infants to HIV in breast milk.

DRUGS RECOMMENDED FOR POST-EXPOSURE PROPHYLAXIS/TREATMENT

It is recommended that in India zidovudine (ZDV) and lamivudine (3TC) be used as follows. Both these drugs should be considered for treatment of all exposures involving HIV-infected blood, fluid containing visible blood, or other potentially infectious fluids or tissues (ZDV-200 mg x 8 hrly). Used in combination, ZDV and 3TC are very effective in treating HIV infection after exposure and considerable information shows, that they are safe when used for a short time (Lamivudine 150 mg x 12 hrly).

In selected cases (HIV status code 1 to 2 and EC code 2 and 3), Indinavir (or one of the other protease inhibitors) is also being used as per PEP guideline.

DURATION FOR WHICH DRUGS NEED TO BE TAKEN

The optimal course of treatment is unknown; since 4 weeks of ZDV appears to provide protection against HIV infection, if tolerated, treatment should probably be taken for 4 weeks.

PREGNANCY AND PEP

Based on limited information, ZDV taken during 2nd or 3rd trimesters of pregnancy has not caused serious side effects in mothers or infants. There is very little information on the safety of ZDV when taken during the 1st trimester or on the safety of other antiviral drugs taken during pregnancy. If the HCW is pregnant at the time of occupational exposure to HIV, the designated authority/physician must be consulted about the use of anti-viral drugs for post exposure treatment.

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FACTS KNOWN ABOUT THE SAFETY AND SIDE EFFECTS OF THESE DRUGS

Most of the information known about the safety and side effects of these drugs is based on studies of their use in HIV-infected individuals. For these individuals, ZDV and 3TC have usually been tolerated well except for nausea, vomiting, diarrhoea, tiredness, or headache for people taking ZDV.

STEPS TO BE UNDERTAKEN BY THE INFECTION CONTROL OFFICER ON RECEIVING INFORMATION ABOUT OCCUPATIONAL EXPOSURE

- All the needle stick injuries should be reported to the AIDS State Society giving the exposure code and the HIV status code in a proforma enclosed (Annexure 17.1).
- The State AIDS Societies should in turn inform NACO about the cases periodically.
- A registry is planned to be opened in NACO soon, for follow-up of all such cases.
- NACO has decided in principle to supply antiretroviral drugs to all cases for post exposure prophylaxis for HCW in Govt. hospital settings.
- Infection control officers in all hospital have been directed to ensure that anti retroviral drugs for PEP are available in casualty at all the times.

Chapter - XIII

WOMEN AND HIV INFECTION INCLUDING MOTHER TO CHILD TRANSMISSION

In 1981 the first Human Immunodeficiency Virus infected case was seen in USA. At that time it was considered a disease of males. Now 18 years later the rapid increase in the number of women infected with HIV worldwide forcasts an inevitably greater number of women who will develop and die from acquired immunodeficiency syndrome. Currently, almost half of all new HIV infections are being reported in women. Of these less than 50% are aware of their infection and 84% are in the reproductive age group that is 15 to 45 years. Hence, worldwide the HIV risk for women is rising. Women are close to half of the world adults population who daily contact infection. And 9 out of 10 infected women live in a developing country.

From exclusive male disease HIV/AIDS is now almost equally distributed in both sex

Table 1. AIDS and HIV infections in South-East Asia as of 1 March, 1999

Country	Reported AIDS Cases	Date of Last Report	Estimated HIV Infections	Rate per 1,00,000 Population
Bangladesh	10	3/97	21,000	16
Bhutan	1	8/98	< 100	< 16
DPR Korea	0	11/96	< 100	< 1
India	6,252	3/98	4,000,000	418
Indonesia	230	2/99	25,000	12
Maldives	5	3/98	< 100	< 25
Myanmar	2,312	3/98	440,000	760
Nepal	183	1/98	25,000	66
Sri Lanka	77	3/98	6,000	32
Thailand	83,357	3/98	960,000	1,345
Total	92,427		5,600,000	> 358

(#) 1996 population estimates for all countries except Bhutan are based on UN population figures for mid-1994, with annual growth rates applied.

As we see in the table, India has the maximum number of HIV infected cases as on Ist March, 1999. It is estimated that two adults get infected every minute and 0.5 million

young people, 230,000 women and 30,000 children get infected every year. Though the country is vast, the number is also substantial and must alert us. In Mumbai, HIV seroprevalence doubled from 20% to 40% between 1992 and 1994 among female commercial sex workers. As in Africa, evidence suggests that the epidemic is spreading rurally in India along commercial truck-routes.

Because of the underecognition of HIV in women the actual epidemic burden is probably greater than reported.

FACTORS INCREASING VULNERABILITY OF FEMALES

Throughout the world unprotected heterosexual exposure is the primary risk factor for HIV infection in adolescent and adult females. More than four-fifth of all infected women get the virus from a male sex partner; the remainder become infected from a blood transfusion or from injecting drugs with contaminated needles. More and more adolescent and younger females are becoming victims of HIV. Most of the causes of this are listed below:

1. **Sexual relationship**

   Sexual relationship of women are often with older men, who are more likely to be HIV infected and at an advance stage of the disease. This increases the risk of transmission.

2. **Male of female transmission of HIV**

   It is 2 to 27 times higher as reported by different workers than vice versa. Padian et al 1995 reported a 17 times higher risk for females while Nicolosoi et al. 1994 reported a two fold increase in the efficiency of male to female transmission when compared to female to male transmission.

3. **The social factor**

   The custom of slecting significantly younger women as wives make them culturally vulnerable to HIV infection at a younger age.

4. **Biological factor**

   Younger women's immature cervix (cervical ectopy) and relative low vaginal mucus production presents less of a barrier to HIV, making them biologically more susceptible to infection. The same is true in younger age of sexual abuse and child prostitutes. As a consequence women are increasingly becoming infected with HIV at a younger age then men. More girls and younger women are becoming infected in their teens and early twenties than women of any other age group.

   As compared to men, females have a larger surface area of mucosa exposed during intercourse to their partner's sexual secretions. Semen infected with HIV typically

contains a higher concentrations of virus than of the women's sexual secretions. This makes male to female transmission more effective than female to male. Sex during menstruation and anal sex also favour male to female transmission.

5. Previous RTI/STI

As is well established, STD and RTI causing ulcers and discharge increase the chances of HIV transmission. 7.8 Female patients with STD present few symptoms and often go unnoticed and untreated. Also chances of wome reaching a health facility, where proper treatment is available, is low. All these contribute to increasing the number of HiV infections in females.

6. Economic Factor

Women are economically dependent on men. Hence they cannot insist on safe sexual practices like the use of condoms by males. Urbanization, male migration, changing social structure, poverty and gender inequality influence the risk of HIV infection among women.

7. Blood

There is increased vulnerability to HIV transmission through untested infected blood in women. Women receive blood transfuctions more often than men because of anaemia and complication of pregnancy and childbrith including unsafe abortions.

To reduce the venerability of women to HIV infection it is important to ensure support from men at all levels. Educational programmes must focus on the media and other means of dissemination of knowledge about how HIV spreads and how it can be prevented. The responsibility of men and women is preventing transmission by engaging in safe sex practices should be given wide coverage. Increasing the age of marriage, and providing economic independence to women are important steps.

- Marriage with an older man more likely of having HIV / AIDS
- Economic dependence on men
- More efficient (-17%) male to female transmission then vice cersa
- Bigger surface area to acquire infection in women
- RTI/STI goes unrecognised in women making them more susceptible to HIV/AIDS
- More blood transfustion in women
- Adolescents the biggest segment indulging in unsafe sex practices

ISSUE CONCERNING PREGNANCY

HIV-1 is expected to infact 10 million children worldwide by the year 2000 and a majority of these children will have acquired their infection as a result of mother-to-child transmission (Clin, 1991). Moreover over 5,90,000 children are infected with HIV each

year by vertical transmission (USAID report 1997)[10]. Since women infected with HIV are the major source of infection for infants, trends in HIV infection among women forecast the impact of HIV in children.

The rate of vertical transmission of HIV from mother to the foetus varies between 15% to 48%[1,12]. The determinates of transmission seem to be multifactorial and include maternal viral load, viral prototype, obsterical factors and maternal immune response viral load in the mother is maximum immediately after infection and in the advanced stage of the disease. Measurement of plasma HIV-1 RNA & quantitative culture, especially the former, is better predictor of vertical transmission. In the current era of potent antiviral therapy these studies provide a scientific rationale for measuring viral laod in pregnant women both to predict risk of transmission and to monitor antiviral therapy.

A high frequency of unprotected sexual intercourse during pregnancy was associated with an increased risk of transmission even after the adjustment of multiple potent confounding variables.[15]

It is knownthat maternal DD-4 & lymphocyte count is an independent predictor of perinatal transmission risk. The mother's neutralizing antibody monoclonal HIV V3 may be a protective association.

Low Maternal Vitamin A

Levels during pregnancy were associated with an increased transmission in a cohort of infected women in Malawi. A 4.4 fold increase in transmission was seen if Vit. A level was less than 0.7 umg/1 (normal > 1.4 uml/1) independent of CD4 count & duration of membrane reputure.[16]

A correlation between the time elapsed from rupture of membranes to actual delivery and an increased risk of transmission is known.[17]

The viral biological phenotype may influence the transmission risk. Monocyte - macrophage tropic (M-tropic) maternal virus isolates are reported to be more likely to be transmitted than maternal isolates of T-cell tropic phenotype.[18]

The presence of sexually transmitted diseases in the mother increases the risk of transmission.

Breaches in the placental barrier could lead to a mixing of maternal and foetal cells. Conditions like chorioamnoonitis, cigarette smoking and illicit drug use are known to be associated with palcental disruption and hence cause an increased transmission risk.[19]

Foetal Factor

Genetic differences in host cell susceptibility to HIV infection of foetal cells have been reported. An association of certain HLA haptotypes with transmissions has been demonstrated. Foetal cell susceptibility to infection could vary by gestational age possibly because of development of CD 4 + expression.[20]

The presence and amount of virus in the genital tract may affect the transmission risk. HIV-1 DNA was detected in 32% of cervical and 10% of varinal samples[21].

Intensive exposure of the infant's thin skin and mucosal surfaces to maternal blood and secretions during the birth process could provide a significant route for viral transmission.

Consistent with a possible route of HIV 1 transmission by oral exposure, in one study HIV 1 was detected in the gastric aspirate from 2 of a 4 new born who were subsequently shown to be infected.[22]

In vasive procedures that breach the infant's skin barrier could provide another mechanism for viral entry (e.g. foetal scalp electrode, scalp blood sampling, episiotomy and operative vagina delivery.

Studies evaluating the influence of Caesarean section on transmission have produced conflicting results. A meta analysis of 11 prospective studies suggested a protective effect.[23]

A recent study of more than 1600 mother-infant pairs from France showed no decrease in transmission after emergency or elective Caesarean section.[24]

It is observed that there is a more than two fold risk of infection of the first born twin as compared to second (26% versus 13% respectively).[25] These data suggest athat the greater risk of infection in the first born may be related to more prolonged exposure of the presenting twin to infectious secretions in the genital tract during the later stages of pregnancy & delivery.

These data suggest sthat the greater risk of infection in the first born may be related to more prolonged exposure of the presenting twin to infectious secretions in the genital tract during the later stages of pregnancy and delivery.

Transmission via breast milk is supported by known transmission of other retroviruses by milk, the detection of HIV-1 in the cellular & acellular compartments of breast milk, and reports of transmission from mothers infected during the postpartum period.[26.]

The risk of transmission varies with the period of breast feeding, amount of exposure, infectivity of milk and specific susceptibility of the infant. It was found that breast feeding beyond 15 months was associated with a 1.9 fold increased risk of infection. 32% of HiV-1 infection was attributed to breast feeding beyond 15 months. It was calculated that the risk of HIV-1, transmission exceeded the potential benefits of breast feeding ater 3-7 months of age.[27]

The newborn's immature gastro-intestinal tract may facilitate transmission; gastric acidity is diminished in the newborn and the mucosa and microvilli are thin with a deficiency in IgA secretingcells. However an immature GIT is not a requirement, because, transmission has been reported in infants beginning breast feeding after the neonatal period.

Reports of transient HIV-1 infection have suggested that the newborn immune response to HIV-1 exposure may have a role in averting transmission. Several researchers have reported finding a transient HIV-1 specific immune response in 18% to 40% uninfected infants born to infected women. These data suggest that cell-mediated immunity in the foetus or new born may have a crucial role in protection or clearance of infection.[28]

RATE OF VERTICAL TRANSMISSION 15-48%

Determinants

A. Maternal

- Viral Load
- Biological Prototype of Virus
- Unprotected Sex during Pregnancy
- Smoking and Illicit Drug use in Mother
- Maternal Level of CD4 & Lymphocyte Count
- Low Maternal Vitamin A Level
- Presence of RTI/STI in Mother
- Time of Rupture of Membranes & Choriomeningitis
- Episiotomy & Operative Vaginal Delivery
- Presence & Amount of Virus in Genital Tract

B. Foetal

- Foetus can Ingest the Virus
- Goetal Scalp Electrode, Scalp Blood Sampling & Umbilical Blood Sampling
- Duration of Exposure to Maternal Secretaions (First Twin)
- Via Breast Milk Depending on the Immune Response and of the Newborn Period of Breast Feeding & Infectivity of Mother

TIMING OF VERTICAL TRANSMISSION

The exact timing of HIV transmission from mother to the foetus or infant is not know with certainty. Some foetuses are infected inutero, others in late gestation or duging delivery orduring purerperium via breast milk in lactating mothers. However the relative proportion of transmission that occurs intra-partum versus intra-uterine remains controversial. The current hypothesis is based on experimental and clinical observations that support these three different periods of transmission.[29].

Intrauterine transmission is documented by HIV identified in placental tissue, foetal blood samples and amniotic fluid, positive viral studies in 20-60% of infected infants at birth and bimodal onset of symptoms with early onset (<12 months) in > 30%.

Intrapartum transmission is inferred by HIV isolation from cervico vaginal secretions, intrapartum exposure to blood, increased infection rate in the first born twin, acute primary infection, virology and immunologic pattern, negative viral studies at birth followed by positive studies in the 1st month of life in 40% to 80% of infected infants, biomodal onset of symptoms with late onset (>12 months) in 70% HIVP 24 antigen in cervicovaginal secretions associated with increased risk of infection, & association of duration of membrane rupture with risk of infection.

Postpartum transmission is judged by HIV isolation from cellular and cell free portions of breast milk, case reports of infants infected by breast feeding from mothers who become HIV-1 infected post partum or from an infected wetnurs. Meta-analysis of pooled data indicates increased attributable risk of infection by breast feeding.

EFFECT OF PREGNANCY OF HIV DISEASE

The vast majority of HIV infected women are in their childbearing years and fertility does not seem to be impaired except in the end-stage severe imunodeficiency state. Minkoff & co-workers (1990)30 reported on HIV positive pregnant women compared with HIV-negative controls. Serious infections were found significantly more often in the HIV positive group only if CD4 counts were lower than 300 cells/mm3 (or 79, C1 4.6 to 14.0). No difference was noted with greater than 300 CD4 cell/mm. To date, the majority of date are unable to support the notion that pregnancy enhances HIV disease progression.

EFFECT OF HIV ON PREGNANCY

Temmerman & associates (1995)31 reported an association between low birth weight & prematurity. A high rate of preterm delivery was noted in women with CD4 cells below 30%. A higher rate of genital ulcer disease, genital warts syphilis serology and post-partum endometritis was noted. Low CD4 counts correlated with post-partum endometritis.

Obstetricians are becoming in creasingly involved in prenatal care of HIV-positive women. Appropriate care of HIV infected women depends on knowing their serostatus. All pregnant women should receive HIV education and counselling and be offered HIV testing as pert of their regular prenatal care so that all pregnant women learn their HIV status. This is the national policy in Thailand. The HIV infected pregnant women should be provided with the appropriate background for an informed reprodcutive choice. If she chooses MTP, safe MTP services must be provided to her. If she prefers to continue her pregnancy, she should be told about the risk of vertical transmission and her antepartum care should be tailored to her specific needs preferably with ample psychological support service to her. The knowledge of their HIV infection & will increase the opportunities for HIV infected pregnant women to prevent HIV transmission to their children. Ideally, counselling and testing should precede pregnancy so that appropriate contraceptive advice can be given. Unfortunately, many infected women do not seek or get prenatal care until the 3rd trimester. Of those who are tested positive in early pregnancy & who choose to continue it, prenatal care will be somewhat altered by serostatus, so too will the clinician's sensibiilty to a variety of the early symptoms of HIV disease. The keys to the appropriate care of the HIV infected women during pregnancy are optimal care of the pregnancy and optimal care of the HIV infection.

General measures of proper diet, hygiene, rest etc., are to be strictly followed, Nutritional counselling should be instituted if difficulty is encountered in maintaining appropriate weight gain. She must have enough sleep and must avoid stress and fatigue. Alcohol, smoking and illicit drugs should be prohibited. Prevention of opportunistic infections is also a critical goal for the obstertrician. As CD4 counts decline and viral load climbs, the patient becomes susceptible to an array of infections. At the current time, critical

landmarks for the introduction of prophylaxis include CD4 count of <= 200 cells per mm^3 Pneumocystis carinii pneumonia may occur. Obstetricians must vigilantly guard against these infections by clinical methods (as CD4 count is costly affair in underdeveloped countries) and modifying appropriate prophylactic therapies (Bacterim or Pentamidine). CD4 counts <= 100/mm^3 may invite Toxoplasma gondii infection & at counts <= 50/mm^3 MAC (Myccbacterium avium complex) & perhaps CMV (Cytomegalovirus) conjunctivitis can occur[32]. Screening for tuberculosis is to be done. Appropriate prophylaxis should be started and may need modification.

Obsteric management (i.e. decisions regarding monitoring obstetric problems and choosing candidates for timing of induced delivery are uninfluenced by a woman's serostatus.

The controversy regarding vaccination, because there is viraemia associated, is to be weighed properly as viraemia during pregnancy poses the theoretical risk of increasing the rate of antepartum transmission of HIV.

INTERVENTIONS AIMED AT DECREASING THE RISK OF MOTHER OF CHILD TRANSMISSION OF HIV INFECTION

The prevention of the vertical transmission of HIV from mother to child can be done by following the broad principles given below :

General Measures

The monther shuold be kept in good health. Due to the concern regarding the potential teratogenicity of Vit A when administered early in gestation, Vit A supplementation over & above the Vit A in the diet is not yet recommended.

Obsteric Measures

Obstetric measures are of considerable importance. Prevention and treatment of sexually transmitted diseases and chorioamniothits and discontinuation of cigarette smoking and illicit drug use during pregnancy could have important roles in reducing the transmission rosk. the period of ruptured membrance should be kept as short as possible and no deliberate rupture of membrances should be done. Systematic birth canal cleaning has been attempted [33].

A large proportion of mother-to-child transmission is thought to occur at the time of delivery. It is suggested that a low cost, low-tech, approach, which could be adopted in many developing countries, is to disinfect the vaginaprior to and during labour. Several agents have been suggested as potential candidates because of their in-vitro activity against HIV. Benzalkonium chloride, chlorhexidine, nonoxynol 9, betadiene, chlorine bleach etc, Debis et al 1995.

Caesarean delivery is an expensive and invasive intervention & is associated with higher maternal morbidity and mortality than vaginal deliveries. As its relation with mother-to-child transmission is not proven yet; a Caesarean section should be carried out only if indicated because of obstetric causes.

Invasive procedures on the foetus like foetal scalp electrode or foetal scalp blood samples, umbilica cord blood sampling etc. are to be avoided during labour.

Giving a bath to the baby immediately after birth is useful to wash out HIV virus on the foetal boby as it might get a foothold on the skin of the newborn. Milk disinfectants or baby soap and plain running water can be used. In fact, mechanical cleaning may play an important role.

It is suggested that as the virus is very heat labile, if we express mother's milk, boil it and then give it to the infant, it will keep the virus load down.

ANC CARE

- Counselling & knowing HIV status (Preferably before pregnancy)
- Choice of MTP or continuation of pregnancy
- Correct Diet & Anaemia
- Discontinue Smoking & Illicit Drugs
- Regular Check up
- Treat RTI/STI
- Detect & Treat Opportunistic Infection
- Delivery in Hospital
- Do not do Amniotomy, Foetal Scalp Electrode Monitoring, Foetal Scalp Blood Sample or Umbilical Blood Sampling.
- Systematic Cleaning of Birth Canal
- Immediate Bath to Baby

Immunological

Immunological approaches are based on the assumption that more transmission occurs at or around the time of delivery and that a combination of passive and active immunization will be effecting in blocking the transmission. At this stage vaccine is a concept rather than a reality. Passive protection using HIV Ig is presently under investigation (AGTG, 185). Use of hypermmune ant HIV immunolobulin given I.V. to the baby alone or also to the mother (for the reduction of perinatal HIV transmission). Protocols to test neutralizing monoclonal antibodies are in development.

Early umbilical cord clamping is thought to decrease the chance of maternal blood containing HIV to cross over to the foetus. Close monitoring of CD4 cell count should be a routine. If possible PCP prophylaxis is to be started for women with CD4 count below 200/mm with methoprim sulfamethoxazole or if resistant, with pentamidine.

At present the most promising avenue of approach is through the use of antiretroviral therapy should be discussed with the HIV infected pregnant women. The long-term effect of this therapy is unknown.

If trial ACTG 076 HIV transmission rate was reduced by approximately 2/3rd. At 14 weeks of gestation zidovudine 100 mg 5 times a day is given until labour. During labour a loading dose of 2 mg/Kg over the first hour is given followed by a maintenance dose of 1 mg/Kg/hr until delivery. In the neonatal period oral zidovudine syrup 2 mg/Kg orally four times a day for 6 weeks is given. Monitoring of the mother while she is on the

regimen include complete blood count every 2 weeks x 2 and then every month, liver function test every month and serum creatinine level every month. Therapy is discontinued if the hemoglobin is <9 mg/dL, platelet count 100,000 cu/mm, granulocytes are <1000 cu/mm^3. SGPT and SGPT are greater than two times normal and there are serious cardiac, respiratory, neurologic or gastrointestinal (1) problems[34].

In a more recent trial conducted in Thialand, a "short course" 2DV, rigemen given from 36 weeks of pregnancy and during labour is compared with no treatment[35]. 300 mg of zidovudine is given orally twice a day from 3 weeks of gestation until onset of labour. Then 300 mg every 3 hours from onset of labour to delivery. All women are provided with infant formula and are counselled against breast feeding.

Results indicates a significant decrease in the transmission risk of the neonate. The reduction rate are similar the "long course" treatment trial.

Trials on different combinations of anti-HIV drug and hydroxyurea and ddl are on there effect on mother to child transmission are not available yet.

ANTI-VIRAL THERAPY:

- Vaccine
- Passive HIV immunoglobulin IV
- Anti Retroviral Therapy
- AGTG 076 from 14 weeks to Delivery
- Short course from 36 weeks to delivery
  No treatment for infant,
  No breast feeding

PREAUTIONS TAKEN

Stringent following of universal precaustions in the labour room and delivery area is essential to prevent infection of conduction doctor and those who clean the area after delivery:

1) **Barrier :** The most convenient and practical product is "disposable gloving, hand washing, special gown or suit, mask, boot, eye.glass, eye shield, automatic water tap. The mucous trap is attached to ward suction. The pressure should be less than 140 mm Hg to prevent theroretical damage to neonatal gut. Once the child is born universal precautions should be exercised byPaediatric care provider. Gloves should be worn until all secretions have been removed from the skin.

2) **Disinfectant Solution:** 0.5% Sodium hypochlorite or household bleach for cleaning

- 10% Lysol for cleaning metallic table, and chairs
- Dip all linen in household bleach 1% for half an hour before sending to laundry
- Put placenta in a bag with bleaching powder and either burn or bury with bleaching

- Powder in the soil.
- Precaution during operation:
- Double gloving
- (Special puncture - resistant glove if available)
- Untouched technique
- Using eye glasses . Shield, special gowns & boots.

HIV-EXPOSED NEWBORN

The actual HIV status of the newborn cannot be obtained upto 18 months of delivery, as mother's antibodies are present in neonate till 18 months of age. Polymerase chain reaction (PCR) and p24 antigen analysis, which are very costly and not available at all places they give the true picture of HIV status of the newborn earlier their 18 months of age. So HIV exposed new born is to be followed for 18 months of age and the mother is counselled about the merits and demerits of breast feeding.

DURING DELIVERY

*** Precautions by Obstetrician**

- Universal Precaution
- Gloves
- Gown
- Mask
- Boots
- Eye Glasses

Mucous Trap-

Eye Protection Shield

- Automatic Water Tap

*** Precaution by person who cleans labour room**

- Universal Precautions
- Pour Bleach Solution on Labour Table for Half an Hour
- Clean with Bleach Solution
- Dip Dirty Linen in Bleach Solution for Half Hour before Sending for Laundry
- Placenta disposed off in bag containing bleaching powder - either incinerate or buried with bleaching powder all around

Precaution during MTP or Casearean Section

- Universal Precautions
- Double Gloves
- Gown
- Boot
- Eye Glasses
- Eye Protection Shield

GYNAECOLOGICAL CARE

Preliminary data from Women's Interagency HIV study (WIHS)[86] suggest that HIV infection with CD4 count less than 200/mm^3 is associated with an increase in the prevalence of amenorrhoea. Oesophageal candidiasis is occurring 30% to 50% more commonly in women[17]. Chronic Herpes simples infections may be more likely to develop in woman then in men. The most common conditions that manifest differently in HIV infected women are gynaecological infections, including vaginal infections of candidiasis, trichomoniasis and bacterial vaginosis. The WIHS reports a 10 fold increase ingenital warts in HIV infected women. HIV infected women have a higher prevalance of CIN and higher rate of human pailloma virus infection than non HIV infected women.[38] Hence pap screening can be incorporated into HIV infected women's care.

Women infected with HIV may have more frequent and severe epidodes of PID (pelvic inflammatory disease).[39]

GYNAECOLOGICAL DISEASES IN HIV / AIDS LADY

- More Oesophageal Candidiasis
- More Trichomonasis
- More PID
- More Cin & Human Pailloma Virus Infection

CONTRACEPTION AND HIV

In HIV infected women there is dual risk of STDs (including HIV / AIDS) and unwanted pregnancy. These women may face a heightened risk of HIV transmission depending upon their choice of contraceptive method.

The intrauterine contraceptive devices may cause increased bleeding and thus an increased number of susceptible or infected cells in the lower genital tract. Intrauterine contraceptive devices have been associated with an increased risk of pelvic inflamatory disease (PID) and fmay increase the risk of HIV transmission.

On the other hand condoms (and to a lesser extent) spermicides and cervical caps may lower the risk of HIV transmission but are not excellent contraceptive measure: Female condoms, when freely available, will become a better contraceptive choice (as its use will be under the control of the women). Spermicidal drugs are used in the absence of vaginal inflammatory reaction to them. In some women using nonoxynol-9 spermicide impregnated vaginal sponge (Today) there was an increased freguency of genital ulcer, vulvits and HIV acquisition among spermicide users.[40]

ORAL CONTRACEPTION

Oral contaception is a very efficient contraception method. But cervical ectopy, which can result from them may increase HIV transmission and acquisition. Oestrogen may impair cell-mediated immunity by directly suppressing mucosal plasma cells, by decreasing level of secretory IgA or by altering T-lymphocyte function.[41]

Drug interactions have been reported with the use of oral contraceptive & antitubercular eg., rifampicin, have been shown to increase the metabolism of oral contraceptives. In a prelimistudy ritonavir was found to decrease ethinyl oestradiol concentrations in 23 women.42 The interactions are expected to lead to decrease in cotraceptive efficiency.

Thus we see that no single agent provides ideal contraceptive efficiency and good protect against STD acquisition for women with HIV.

If the family is complete, in an HIV positive women, tubal sterilization/vasectomy and the use condoms will ideal. But is is difficult to insist on condom use within marriage. The advantage of the use two methods at the same time must be clearer in public campaigns. This may increase their use.

Norplant with condom use may be considered for spacing but if there is more bleeding duruperiods the method is to be discontinued.

Natural History of HIV disease in Women

The overall difference between the natural history of HIV disease in females and males is minimum exception that there is more oesophageal candidiasis and genito-urinary cancers and infections in women. Hence management is to be similar to that of males as given in other chapter of the book.

Ethics & HIV Disease in Women

Before testing for HIV there is pretest counselling, after taking on informed written consent and ensuring complete confidentiality. A pregrant woman is concerned abou her unborn child. Hence while framing HIV testing policy of a country we must keep HIV positive pregnant women in mind. She has the right to information as to her HIV status and the effect on her unborn child, influence of breast feeding and even the effect of anti ritroviral therapy. She must know the side effects of these drugs.

Conclusion

Obstetrician & Gynaecologists have to consistently fulfil the obligation to advocate the health of women. For this to keep abreast with most recent developments in HIV/AID is essential. Keeping utmost secrecy and non insistent (but gentle) persuasion to bring her partner along will bear better fruits as otherwise she will disappear from your care and will report only when she is in a very advanced stage of the disease and has spread it without any knowedlge. Reaching the adolescents and giving them knowledge of safer sex practices is the need of the hour as they most unfortunate part of this epidemic of HIV is that these are the most affected group. Reaching adolescent girls is difficult as in India a most of them are out of school by this age. Extensive dissemination of health information through the media is essential to prevent the HIV epidemic from spreading.

FAQ -NEVIRAPINE

1) What is Nevirapine? How does it work?

- Nevirapine is an antiviral drug belonging to the group of the non-nucleoside reverse transcriptase inhibitor (NNRTI). By binding with the HIV-l virus enzyme called 'Reverse Transcriptase', it inhibits the multiplication of the virus and therefore reduces the amount of virus in the blood.

- There are various types of HIV viruses. Nevirapine only works for the HIV virus type 1.

2) How is Nevirapine supplied?

. Nevirapine is supplied in two formulations:

- As white, oval tablets, each containing 200 mg of Nevirapine and packed in boxes of 100 tablets

- As an oral suspension, at a concentration of 10 mg per ml

3) When is Nevirapine prescribed?

- Alone, as an antiviral drug, Nevirapine can only be used for Prevention of Mother-To-Child Transmission of HIV (PMTCT). It should not be used for treatment of HIV.positive patients with or without AIDS manifestations, or for Post-Exposure Prophylaxis (as a preventive measure when someone has been potentially accidentally exposed to the HIV virus). In PMTCT, the currently recommended regimen is:

  For the pregnant woman: 1 tablet of 200 mg of Nevirapine at the onset of labour

  For the newborn: 2mg/kg of oral suspension within 72 hours of birth

- Other regimens are currently being studied in clinical trials (research) but are not used in regular PMTCT programmes.

- Nevirapine is the drug of choice for PM TCT throughout the developing world (where triple therapy is not affordable) and is currently used in more than 30 countries.

- In association with other antiviral drugs, Nevirapine is used to treat HIV infection in patients with or without AIDS manifestations. The currently recommended regimens always combine three drugs hence the term of 'triple therapy' utilised.
- Nevirapine is not a cure and may not decrease the number of HIV related illnesses.
- Nevirapine should never be taken without medical prescription, guidance and monitoring.
- Except in the specific context of PMTCT, Nevirapine does not prevent the spread of HIV to others.
- In PMTCT, the current protocol only aims at preventing the transmission of the virus from an infected pregnant woman to her newborn. Nevirapine does not provide any other benefit to the mother.

4) What happen when someone takes Nevirapine?

- Nevirapine is readily absorbed (>9010) after oral administration. Its absorption is not affected by food. Nevirapine is widely distributed via the blood stream into various tissues and organs of the body including the brain. It also crosses the placenta and is found in breast milk.
- After oral administration, maximum concentration is observed in the blood after 4 hours. Hence, to obtain the full benefit of the drug in PMTCT,
- Nevirapine needs to be given to the pregnant woman as early as possible during labour and at best at least 4 hours prior to the delivery.
- After absorption and diffusion throughout the body, Nevirapine undergoes a biotransformation in the liver and the products of this process are excreted in the urine. Therefore Nevirapine should not be given to people with liver problems.
- After one single oral dose of Nevirapine, the serum concentration of the drug is sufficient to ensure drug efficacy for about 40 hours. Hence, the Nevirapine

protocol currently used in PM TCT maintains an efficacious serum concentration (>100 ng/ml) throughout the infant's first week of life.

5) Can Nevirapine have negative health effects?

- Nevirapine is generally well tolerated. The only adverse events documented were observed in patients receiving Nevirapine in combination regimens for treatment or people having taken high doses of Nevirapine for Post-Exposure Prophylaxis.
- The most frequently observed side effects in adults and children are rash, fever, fatigue, nausea and headache.
- Rash is the most frequent clinical side effect of Nevirapine and it is observed in 10/0 to 20/0 of patients. It occurs mostly during the first month of treatment.
- Elevated liver function tests are the most frequently observed laboratory abnormality associated with treatment by Nevirapine. It is recommended to monitor liver functions especially during the first six months of treatment. Some cases of granulocytopenia (low level of white cells) and anemia have been described in children.
- These adverse events have not been observed in mother or infant receiving a single dose of Nevirapine each in the context of PM TCT.

6) What is the efficacy of Nevirapine in Prevention of Mother- To-Child Transmission of HIV?

- The efficacy of Nevirapine is about 50/0 and the transmission rate of the HIV virus from the mother to the child is about 10/0 at 2 months as opposed to 25/0 to 35/0 without any intervention.
- Hence Nevirapine decreases significantly the risk of transmission but does not give a 100/0 assurance that the baby won't be infected because infection can occur during pregnancy and through lactation. Nevirapine targets transmission during labour and delivery only.

ANNEX 1

HIV Counselling and testing

Counselling is a dialogue, which aims to enable an individualto take decisions and find realistic ways of coping, Counselling is not the same as giving advice or telling people what they should do. A counsellor's role is to listen to an individual's concerns, ask questions, and provide information and emotional support.

HIV testing must be voluntary and carried out with informed consent. Testing without consent is unacceptable and a violation of human rights. A pregnant woman tested without her full consent may also be less likely to use antenatal and other health services through fear of disclosure of discrimination. Consent must be expressed and specific. Informed consent means not only agreeing to the test itself, but also understanding the implications of a positive or negative result. An informed choice is once made freely without pressure.

Counselling and testing must be confidential. Confidentiality is a right and only the person concerned has the right to know his or her status. Breaking confidentiality can expose an individual to discrimination. Too much emphasis on secrecy can, however, increase stress and make it more difficult for someone with HIV to cope. Promoting shared confidentiality means encouraging an individual to identify others they can trust such as their partner, a friend or health worker. Testing must always be accompanied by pre-test and post-test counselling.

Pre-test counselling

Anyone considering a HIV test should always have pre-test counselling, to provide them with full information about HIV and the test, to help assess if he or she has been at risk, to learn about the implications of testing, decide whether or not to be tested, consider the implications of a positive or negative result, and think about preventing HIV infection.

Pre-test counselling is also essential to obtain informed consent. If after counselling an individual is unwilling to have an HIV test, the health worker has no right to compel that person or to refuse to treat her or him.

For pregnant women, an important consideration in deciding about testing is whether knowing their HIV status will make a difference to their decisions about breastfeeding and enable them to access services to improve their own health care.

Pre-test counselling involves the counsellor :

- Providing information about HIV and AIDS and how HIV is transmitted.
- Explaining or determining the reasons for HIV testing and assessing risk through sensitive discussion of possible sexual exposure, intravenous exposure or blood contact.
- Providing information about the HIV test and how it works, including explaining about the window period of infection (see next page)

ected, the result may be negative.

- providing information about the benefits and possible disadvantages of testing.
- explaining the steps that will be taken no maintain confidentiality.
- reviewing the implications of a positive test result, including explaining about supplementary testing to confirm the initial positive result.
- in the case of possible recent infection and in case this is the window period, discussing the possible need for another HIV test 3-8 weeks later.
- discussing what the individual will do if the test result is positive, who they might plan to tell and where they can obtain support.
- for pregnant women specifically, discussing the implications of a positive result for the unborn child, interventions available to reduce MTCT, and infant feeding issues.
- discussing the implications of a negative result and issues related to safer sex and prevention of HIV infection and the importance of remaining negative while breastfeeding.
- providing information about test procedures, that it involves taking a blood sample, how many tests might be required, and how long it will take for the result to come back from the laboratory.
- giving the individual enough time to think about whether or not they wish to take an HIV test, and if they are undecided make another appointment.
- obtaining informed consent if the individual has decided to go ahead with a test.

HIV tests

HIV tests are used for screening donated blood, epidemiological surveillance of HIV prevalence or trends, and diagnosis of infection in individuals. A qualified person should take blood samples, using universal precaution against accidental transmission, which include safe disposal of needles and syringes. In most cases, blood specimens will be sent to a laboratory. Any testing strategy must be undertaken with appropriate laboratory and quality control procedures in place.

Most tests are based on the direction of antibodies to HIV in serum or plasma (using a sample of a person's blood). HIV antibodies are produced from within three to eight weeks of infection. The period before antibodies become detectable is called the window period. Antibody tests detect the presence of HIV indirectly, by checking for antibodies to the virus. Antibodies are much easier to detect than the virus itself.

All infants born to mothers with HIV have maternal antibodies in their blood at birth, but this does not mean that the infant is infected. By the age of 18 months all infants of HIV-infected mothers have lost the maternal HIV antibodies, and only those infants who have been infected with the virus, either before or during birth or through breastfeeding, will produce their own antibodies to HIV. Antibody tests cannot, therefore, detect HIV-infected infants until the age of about 18 months.

The most commonly used type of antibody test is the ELISA (enzyme-linked immunosorbent assay). ELISA testing requires skilled technical staff, well-maintained equipment and a steady power supply, and for these reasons is lesss suited for smaller or more isolated hospitals, clinics or laboratories. The price of ELISAs and other screening tests ranges from around USSO.45 to 52.00.

Rapid and simple antibody tests do not need such specialised equipment or staff but can equal the performance of ELISAs. These tests are called rapid if they take less than 10 minutes and simple if they take longer. These tests are appropriate for use in small laboratories and for emergency testing, but they are more expensive than ELISAs and require refrigeration facilities. For individual diagnosis, if the initial result is positive, it must always be confirmed using a supplemental test, usually another type of ELISA and / or a simple or rapid assay.

Post-test counselling

Counselling after an HIV test is as important as pre-test counselling, whether or not someone is infected with HIV. It should be private and the individual or couple should be asked if they with to know the result, and told that, whether or not they do, the result will be kept confidential.

Where the result is negative, the counsellor needs to :

- deal with the feelings arising from the result
- discuss prevention of HIV infection.

ANNEX 2

Antiretroviral theerapy

Antiretroviral (ARV) therapy for women whom testing shows to be already infected with HIV, is an intervention for which there is clear evidence of effectiveness in reducing MTCT. ARV treatment reduces the amount of HIV in the body, mainly by slowing down the replication of the virus.

Two ARV regiments have been shown to be effective with mothers who do not breastfeed. A Study carried out in the USA and France (the ACTG076 study) found that the antiretroviral drug, zidovudine (AZT), reduced MTCT by two thirds. The therapy was given to HIV-positive women, orally from between 14 and 34 weeks of pregancy and intravenously during labour, and to their infants for six weeks after delivery. None of the mothers breastfed their infants. Recent reuslts froma a study in Trhailand showed that a shorter regimen, where AZT is given orally during the last three weeks of pregancya and during labour, reduced MTCT by 50 per cent. Again, none of the infants were breastfed.

Ongoing trials are assessing the effectiveness of other regimens in reducing MTCT, including in infants breasfed by HIV-positive mothers who receive ARV therapy during pregnancy and delivery.

Where an HIV-positive woman is offered ARV therapy to reduce the risk of MTCT during pregnancy and delivery, she should be counselled and given full information in order to decide whether or not she wishes to accept the therapy. She should also be provided with information about the risk of HIV transmission through breast feeding, informed that if she breastfeeds there is no guarantee that the reduction in transmission through ARV therapy will be achieved, and offered support for replacement feeding.

ANNEX 3

Breast feeding

Nutritional benefits

- Breastmilk is the best food for infants. It provides an infant's complete nutritional needs up to the age of six months. up to 50 per cent of nutritional requirements between 6-12 months and 34 per cent between 12-24 months. The unique nutritional properties of breastmilk include the right amounts of protein, iron and other micronutrients, long-chain polyunsaturated fatty acids esstial to developments of the brain. There is evidence of higher intelligence scores in children who have been breastfed.
- Colostrum, the milk produced in the first few days of life, normally contains a high concentration of vitamin A, which is essential for the proper functioning of the infant's eyes, skin,membranes and immune system.
- Breastmilk contains enough water even in very dry and hot areas.
- Breastmilk is easily digested and its composition changes to meet the development needs of the growing infant. It contains enzymes that help the complete digestion of fat.

Protection against infections and other illness

- Breastmilk, especially colostrum, has anti-infective properties that help to protect the infant against infections.
- Infants who are breastfed have fewer illnesses than those fed with breastmilk substitutes, in all countries and socio-economic settings.
- Breastfeeding helps to protect infants against diarrhoeal diseases, acute respiratory infections and oritis media, and reduces the risk of infant death from infections and malnutrition in developing countries. Mortality of non-breastfed infants from diarrhoea may be 14 times that of breastfed infants. Breastfeeding during illnesses such as diarrhoea promotes recovery.
- Breastfeeding can reduce the risk of septicaemia and neonatal necrotising entercolitis in newborn infants.
- Breastfeeding may also reduce the risk of meningitis, urinary trace infections, eczema, respiratory wheeze, diabetes, chronic intestinal disease, and Sudden Infant Death Syndrome.

Contribution to maternal health

- Exclusive breastfeeding on demand, including at night, delays the return of fertility for up to six months and plays an imjportant role inbirth spacing, especially where women lack access to other forms of contraception. Longer birth intervals are beneficial for the health of mothers and their children.

- Breastfeeding promotes ponding between the mother and her infant.
- Breastfeeding helps the uterus to contract after delivery and reduces bleeding.
- Breast feeding protects women's health because it reduces the risk of ovarian, breast and other reproductive cancers later in life.

Economic benefits

- Breastfeeding is the most economical method of infant feeding, saving money and time and reducing the coses of health care for sick infants. Providing breastmilk substitutes for an infant may cost more than half of the per capita GNP in some countries (see Table below).

Costs of infant formula, March 1998, based on figures reported by UNICEF fiedl offices and counterpart NGOs.

Country	Formula cost (cheapest commercial infant formula)	Full cream powdered milk cost	Cost of 6 mos formula, 20 kg	Cost of 6 mos full cream powdered milk 20 kg	Total cost of breastmilk substitutes for one year	GNP/capita from SOWC 1998	Total cost as percent of CNP/capita (without fuel, water, health care)	Cost as % of minimum urban wage (where known)
Central African Republic	52.63/250g	52.92/200g	5210	5292	5502	5340	148%	
Kenya	55.00/500g	54.73/500g	5200	5189	5389	5280	139%	84%
Malawi	52.80/500	53.80/500	5112	5152	5264	5365	72%	
Zimbabwe	52.81/500g	51.83/500g	5112	574	5186	5540	34%	
Nigeria	52.50/450g	51.50/450g	5110	566	5176	5260	68%	
Sri Lanka	53.21/450g	51.05/400g	5143	553	5196	5700	28%	
India	53.00/500g	51.60/500g	5120	564	5184	5340	54%	
Pakistan	53.00/400g	512/2500g	5150	596	5246	5460	53%	31%
China	52.00/500g	51/500g	580	540	5120	5620	19%	
Viet Nam	52.50/400g	53.00/450g	5125	5132	5257	5240	10%	
Thailand	51.98/450g	51.76/1000g	587	535	5122*	52740*	-	
Philippines	52.01/400g	51.65/400g	5100	583	5183*	51050*	-	
Argentina	520/1000g	53.40/500g	5400	5136	5536	58030	7%	22%
Nicaragua	53.00/450g	52.50/450g	5132	5110	5242	5380	65%	
Halti	54.00/100g	510/200g	5800	5100	5900	5350	257%	
Ecuador	53.32/500g	511/2500g	5133	588	5221	51390	16%	
Hexico	56.89/1100g	54.80/900g	5152	5107	5259	53320	8%	
Brazil	54.00/454g	52.68/500g	5176	5107	283	53640	8%	22%
USA	56.59/340g	56.59/340g	5389	5389	5778	526980	3%	6%

* GNP/capita figure from SOWC 1998 precedes current Asian financial costs, while costs of formula and milk reflect current exchange rates. No percentage can be calculated.

** American Academy of Pediatrics recommends use of infant formula for a full year by all children who are not breasted. No calculation is made for use of whole milk in first year.

ANNEX 4

Making breastmilk substitutes available to infants of mothers living with HIV

The International Code of Marketing of Breastmilk Substitutes recognizes that the encouragement and protection of breastfeeding is an important part of the health, nutrition and other social measures required to promote healthly growth and development of infants and young children, and that breastfeeding is an important aspect of primary health care. It was adopted in response to concerns that the inappropriate marketing of breastmilk substitutes and related produces was contributing to unsuitable feeding practices that placed infant health at risk. The Code aims to prevent the promotion of breastmilk substitutes and related produces to the general public or through the health care system. These Guidelines are intended to be applied in accordance with all provisions of the Code and subsequent relevant World Health Assembly Resolutions.

The Code does recognise that there are exceptional situations when alternatives to breastfeeding are necessary. The present guidelines provide advice concerning such an exceptional situation. They address the pressing public health issue of how best to meet the nutritional requirements of infants of HIV infected mothers. The guidelines suggest ways in which decision-makers can ensure such infants have access to breastmilk substitutes (for as long as they need them. At the same time, again recognizing that breast feeding remains the very best way to feed the vast majority of infants, the guidelines suggest ways in which breastmilk substitutes that are intended for infants who are at risk of HIV infection through breastfeeding reach only these children in need.

WHA Resolution 47.5, paragraph 2(2) helps to ensure that the aforementioned conditions are satisfied by urging Member States "to ensure that there are no donations of free or subsidized supplies of breastmilk substitutes and other products covered by the International Code of Marketing of Breastmilk Substitutes in any part of the health care system. In other words, Members States are urged to take measures to ensure that there is no donation of supplies of breastmilk substitutes from manufacturers and distributors in maternity and pediatric wards, MCH and family planning clinics, private doctoris offices and child-case institutions. However, the competent national authorities may wish to consider negotiating prices with manufacturers and make breastmilk substitutes available at subsidized price or free of charge, for use by infants of mothers living with HIV. It is recommended that this be done in manner that:

- is sustainable. A long term, reliable supply of suitable breastmilk substitutes and a dependable system for their distribution should be identified and secured.
- does not create dependency on donated or low-cost supplies of breastmilk substitutes since such an arrangement is subject to the good will and generosity of the donor. If the

donation ceases there may be no system in place to make breastmilk substitutes available to the infants who need them.

- does not undermine breastfeeding for the majority of infants who would benefit from it
- does not have the effect of promoting breastmilk substitutes to the general public or the health care system
- assures individual infants sufficient quantities for as long as they need them (six months).

Where the health care authorities or other competent authorities wish to make subsidized breastmilk substitutes available, these should, as a rule, be purchased through normal procurement channels. This ensures that they are only made available to infants that need to be fed artificially. Infants of mothers who have tested positive for the HIV virus fall into this category. This helps prevent the "spillover effect" to infants who would otherwise benefit from breastfeeding.

It is recommended that the following consideration be taken into account in organizing a distribution system.:

- On average, forty 500g tins of commercial infant formula will be required during the first six months of the infants life. Free or subsidized quantities of breastmilk substitutes should thus be made available at a local, decentralized level to avoid the need for frequent trips to a distant distribution point.
- The receipt of free or subsidized breastmilk substitutes is likely to become associated with HIV infection, and care is therefore needed to protect the anonymity of those receiving them to prevent potential stigmatization.
- A general reduction in the wholesale price of breastmilk substitutes by manufacturers as a part of a pricing policy intended to provide produces at low prices on a long-term basis is permitted.

Introduction

Worldwide 2 bilion people are infected with M. Tuberculosis, 8 million new cases and nearly 2 million deaths annually.
40% of these people are in SE Asia.

India:

- India accounts for nearly one-third of the global TB burden.
- TB is a common infection in our country.
  40% of the Indian population has TB infection.
- Every day more than 20,000 people become infected with the TB becillus and more than 5,000 people develop the disease.
- Every year 20 lakh peojple develop TB, of which at least 8 lakh are infectious (sputum positive).
- Untreated TB cases spread the infection to others inthe community.
  Each infectious patient can infect 10-15 individuals in a year unless effectively treated.
- In India, TB kills 14 times more people than all trojpical diseases combined, 21 times more than malaria, and 400 times more than leprosy.
- TB kills more women than all cause of maternal mortality combined.

Infected persons can develo[tuberculosis disease at any time. The chance of developing disease is greates shortly after infection and then steadily lessens as time goes by. Physical or emortional streses may trigger progression of infection to disease. The most important trigger is weakening of immune resistance, especially by HIV infection.

Globally, the HIV epidemic is increasing the number of tuberculosis cases and accelerating the spread of the disease. In HIV infected persons, Mycobacterium TB is quick to gain an upper hand over the fbeleaguered immune system and spreads to various parts of the body. There is increased risk of develojping TB in HIV positive persons due to reactivation of quiescent focus or progression of recent infection to disease. Currently, approximately 8% of global TB is attributable to HIV infectio, but this proportion is expected to increase in the future.

EPIDEMIOLOGY OF HIV/AIDS

Acquired Immunodeficiency Syndrome caused by the Human Immunodeficiency Virus is posing a challenge to all the medical professionals globally. In this era of advanced technology, we have not been able to find a cure nor a vaccine for AIDS despite the efforts of the last twenty years.

The Human Immunodeficiency Virus breaks down the immune system leaving it vulnerable to many life threatening infections and malignancies. Since the first AIDS case was detected in USA in 1981, the HIV/AIDS epidemic continues its expansion across the globe with approximately 16,000 new infections a day. HIV has brought about a global epidemic far more

extensive than what was predicted even a decade ago. UNAIDS and WHO now estimate that the number of people living with HIV or AIDS at the end of the year 2001 stands at 40 million. This is more than 50% higher than what WHO's Global Progreamme on AIDS projected in 1991 on the basis of the data then available. About 10.3 million people are dually infected with HIV/TB.

The epidemic is now spreading rapidly in Asia, where new infections are increasing faster than anywhere else in the World, Globally, India has the highest estimated number of HIV infected people in any single country, next only to South Africa.

India's epidemic is marked by heterogencity. It is not a single epidemic but made up of distinct epidemics within the same state. It continues to be driven strongly by hetero-sexual transmission, with the initial foci of HIV being among sex workers, their clients and then spreading into the wider population. At the same time, there are important sub-epidemics evolving with potentially explosive spread among groups of Injecting Drug Users (IDUs), and among Men having Sex with Men (MSM). After the first HIV positive case was detected in a commercial sex worker in Tamil Nadu in the year 1986, HIV infections have been reported in all States and Union Territories. Highest number of AIDS cases have been reported from Tamil Nadu, maharashtra, Karnataka, Andhra Pradesh, Manipur and Nagaland.

The number of HIV positives in India is estimated to be 3.86 million cases. Amongst the AIDS cases reported so far, nearly 60% had TB.

HIV has a unique enzyme reverse transcriptase, which copies the viral ribo-nucleic acid into deoxyribouncleic acid that eventually integrates into the host cell chromosome, thus making it difficult to remove the virus from the body.

Reservoir of infection is a person with the HIV infection. The body fluids responsible for the transmission of the infection are blood, semen and vaginal fluid of an HIV infected person.

Routes of transmission of HIV infection :

1. Through unprotected sexual intercourse with an HIV infected person. Individuals with multiple sexual partners and homeosexuals are at higher risk of getting HIV infection.
2. Through transfusion of HIV infected blood.
3. Through the use of HIV infected syringes and needles.
4. From a pregnant woman to her baby during pregnancy, delivery or by breast feeding.

MODE OF TRANSMISSION	RISK OF TRANSMISSION	CONTRIBUTION TO THE TOTAL NUMBER OF CASES
Sexual transmission	0.01.1.0%	> 80%
Mother to child transmission	30	1%
Blood transfusion	90	3.5%
Infected syringes and needles	0.5-1.0	5.10%

People infected with HIV are infectious lifelong. It takes about 7-10 years for the HIV infected person to develop AIDS. Even during this relatively silent asymptomatic period they are infectious. The natural history of HIV/AIDS can be divided into four stages:

1. **Primary infection :** The virus multiplies rapidly in the body and a mild sero-conversion illness can occur which resolves within few weeks. This is the period when the antibodies are not detected and CD4 cell count is nearly normal. Patinet is highly infectious during this period, also called as window period. This stages lasts for 12 weeks.

2. **Early Immune Deficiency :** During this phase, the immune system has controlled the virus, which is largely restricted to lymphoid tissue. The patient is asymjptomatic, CD4 count is more than 500 cells/ml and antibodies can be detected in the blood. The second stage lasts for 3-5 years.

3. **Intermediate Immune Deficiency :** The CD4 count decreases to 200-500 cells/ml due to the rapid multiplication of the virus in the body. Patient starts showing subtle signs and sysmptoms of compromised immune system. This period lasts from 2-3 years.

4. **Advanced Immune Deficiency :** The virus proliferates throughout the body and overcomes the immune system. Major opportunistic infections and malignancies occur. CD4 counts falls to less thatn 200/ml. The antibodies may not be detected. This is the end stage of AIDS and the patient ultimately dies within 1-2 years.

HIV infection has increased the burden of TB, especially in populations where HIV has become common, and where the prevalence of TB infection is high. It is estimated that worldwide, nearly two billion people are infected with *Mycobacterium tuberculosis*, 40 million are HIV infected and over 10.3 million are dually infected with *M.tuberculosis* and HIV. Over 90% of these dually infected individuals reside in developing nations.

IMPACT OF HIV ON TB

- HIV is the most powerful risk factor for progression from TB infection to TB disease. An HIV positive person infected with M. tuberculosis has a 50% lifetime risk of developing TB whereas an HIV negative person infected with M. tuberculosis has only a 10% risk of developing TB. This is especially important in India where it is estimated

that almost half of the adult population harbors M. tuberculosis.

- HIV infected persons who become newly infected by M. tuberculosis rapidly progress to active TB. Among severely immuno-compromised patients hospitalized with AIDS and exposed to infectious patients, the median time between exposure and disease was 12 weeks.
- HIV will worsen the TB epidemic, HIV breaks down the immune system and makes patinets highly susceptible to TB; these patients can then spread TB to other peopel.
- TB is the most common serious opportunistic infection occurring among HIV-positive persons and is the first manifestation of AIDS in more than 50% of cases in developing countries. A large number of persons who have otherwise latent HIV infection may seek care at TB clinics.
- In India, about 50-60% of HIV-positive patients in India will develop TB in their lifetime.
- In some countries, the HIV epidemic has tripled TB cases.
- In a developing country like India, the potential extra burden of new TB cases attributable to HIV could overwhelm budgets and support services, as has already happened in countries most heavily affected by the HIV epidemic.

IMPACT OF TB ON HIV

- TB shortens the survival of patients with HIV infection.
- TB may accelerate the progression of HIV, as observed by a six-to seven- fold increase in HIV viral load in TB patients.
- TB is the cause of death for one out of every three people with AIDS worldwide.

Despite their increased susceptibility, patients with HIV or AIDS can be cured of TB by Directly Observed Treatment, Short-course (DOTS), DOTS is based, in large part, on research conducted in India over the past four decades.If effectively implemented, this strategy should cut the chain of transmission in the community by curing most of the infectious cases. The Revised National Tuberculosis Control Program (RNTCP)which imbibes the five components of DOTS (political commitment , diagnosis by smear mocroscopy, regular supply of high quality anti-TB drugs, directly observed treatment, systematic monitoring and evaluation), is being implemented in India in a phased manner since 1993. To date, a population of 460 million in 220 districts has been covered , and 80% of the country is expected tobe covered by 2004.

EPIDEMEOLOGY & NATURAL HISTORY OF HIV/AIDS

Human Immuno Deficiency Virus (HIV) infection a global pandemic and consists of different epidemics in different countries.

HIV infection is transmitted by 1. Sexual Route (Heterosexual) 2. Parenteral route (Blood & body fluids) 3. Infected needles & syringes and 4. Vertical transmission (From Mother to Child).

- Heterosexual transmission is the most common mode of transmission in India

Present HIV Scenario

Giobally 42 million people are infected with HIV/AIDS by December 2002
In India 4 million people are infected with HIV/AIDS
In Andhra Pradesh 4 lakh people are infected with HIV/AIDS
16000 people are newly infected with HIV daily globally.
1600 people are newly infected with HIV daily in India.
160 people are newly infected with HIV daily in Andhra Pradesh
87% of total HIV + are between the age group of 15-49 years
50% of these are in the age group of 15-25 years
India stands second in HIV+cases in the world
Andhra Pradesh stands second in HIV+ cases in India

PREVENTION IS THE ONLY SOLUTION FOR HIV

ETERMINATS OF HIV SPREAD

1. Viral factors. HIV is retro virus. Two types of these are identified HIV 1 & HIV 2 which are further divided into subgroups. The transmission efficiency of hiv 2 infection is lower than HIV 1. The Mother to child Transmission of HIV 2 virus is also very low compare ot HIV 1 (1.2% HIV 2, 20-30% HIV 1) Incubation period of HIV 2 is also longer than HIV 1.

   HIV virus is present in all body fluids and organs, the richest being semen, blood, cervical & Vaginal secretions. Semen contains 50 times higher concentration of virus compared to vaginal and cervical secretions and blood. The highest concentration of HIV virus among the body fluids is founding CSF.

2. **Host factors.**

A. Number of sexual partners
B. Frequency of at risk sexual exposure
C. Local HIV prevalence in core groups
D. Type of sexual act
E. Use of condom
F. Presence of STD

Global estimates for adults and children end 2001

People living with HIV/AIDS	40 million
New HIV infections in 2001	5 million
Deaths due to HIV/AIDS in 2001	3 million
Cumulative deaths	25 million

About 14,000 new HIV infections a day in 2001

- More than 95% are in developing countries
- 2000 are in children under 15 years of age
- About 12000 are in persons aged 15 to 49 years, of whom :

  - almost 50% are owmen

  - about 50% are 15-24 year olds

UNAIDS WHO